

FIG. 1

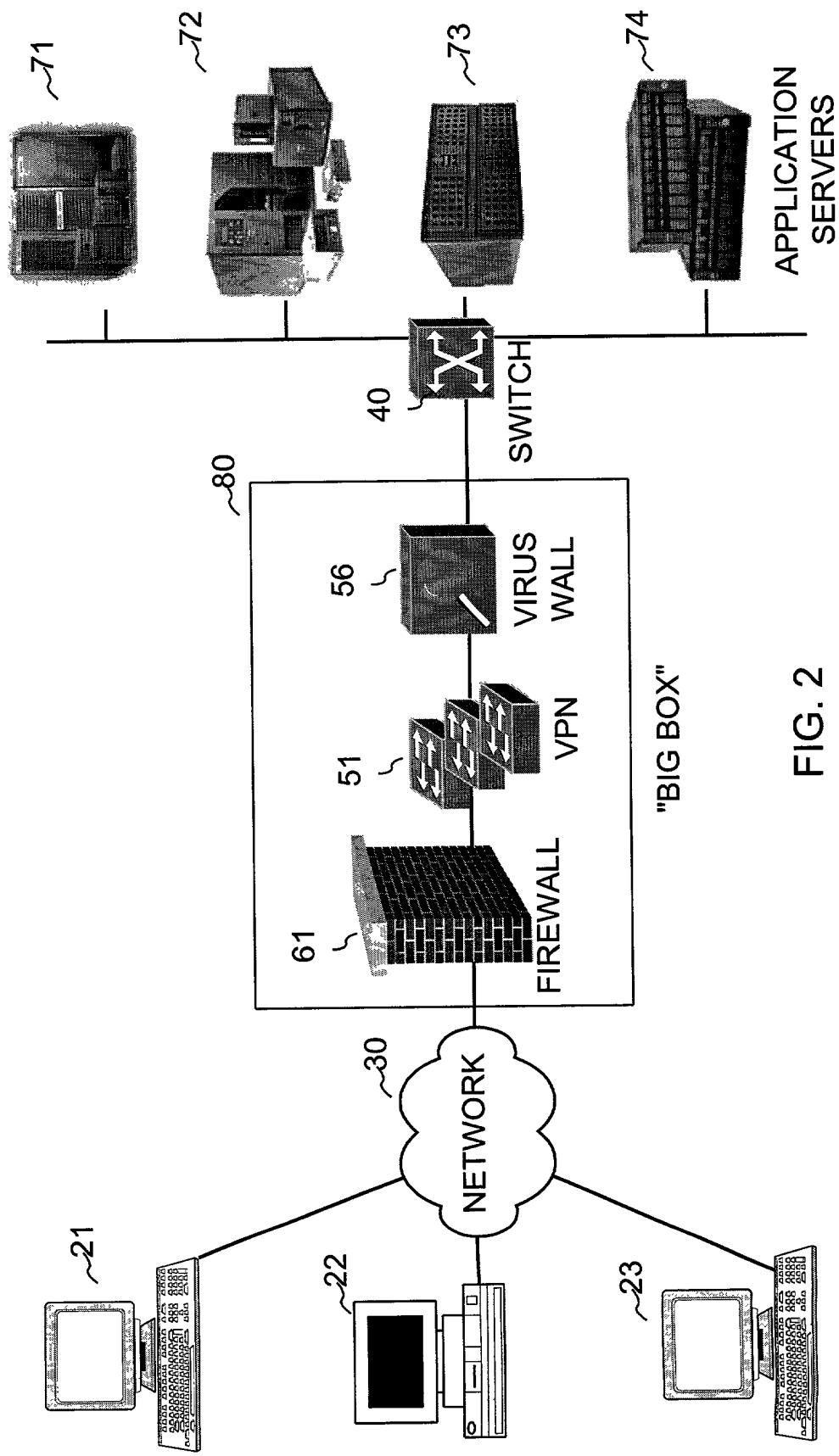


FIG. 2

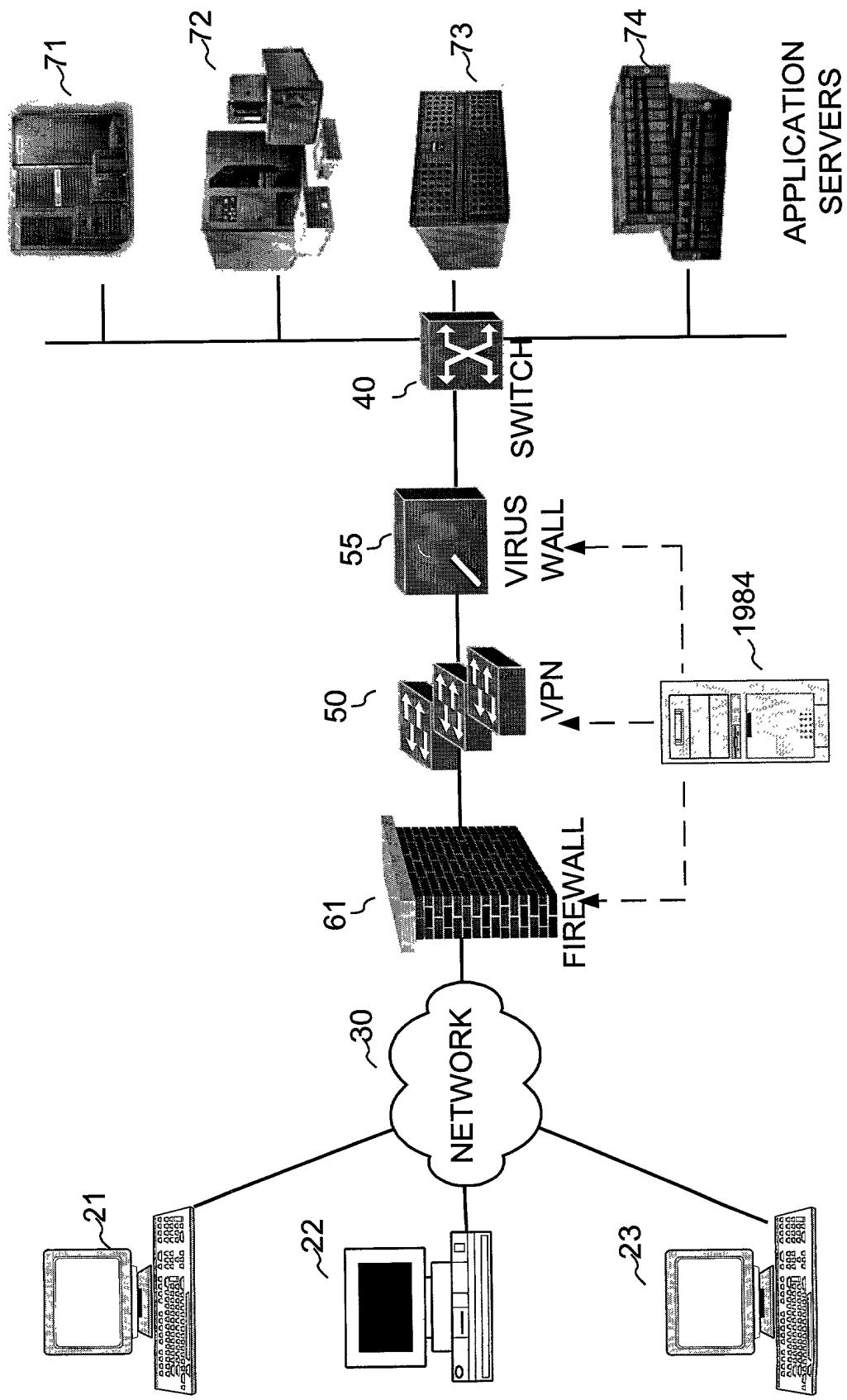


FIG. 3

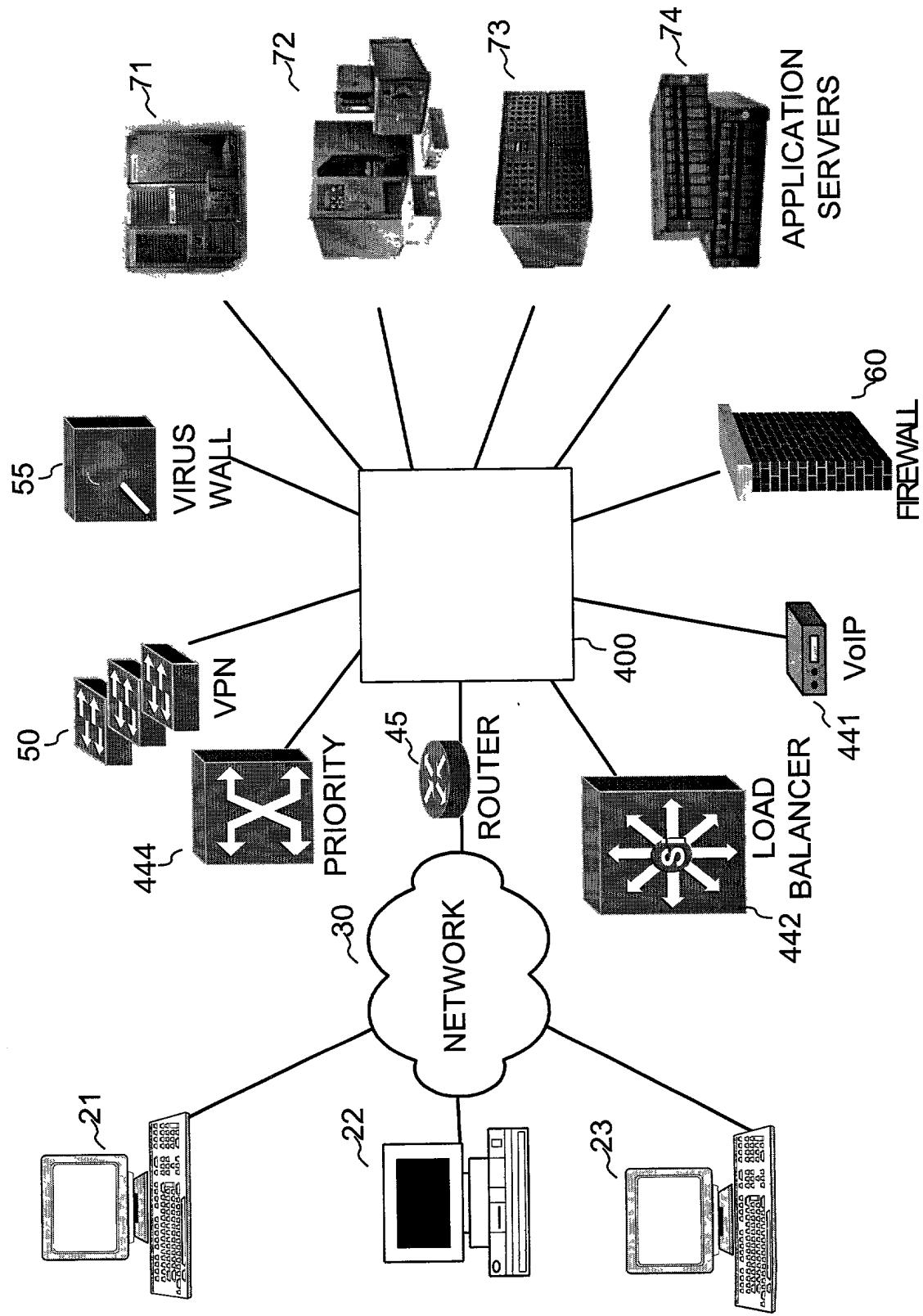


FIG. 4

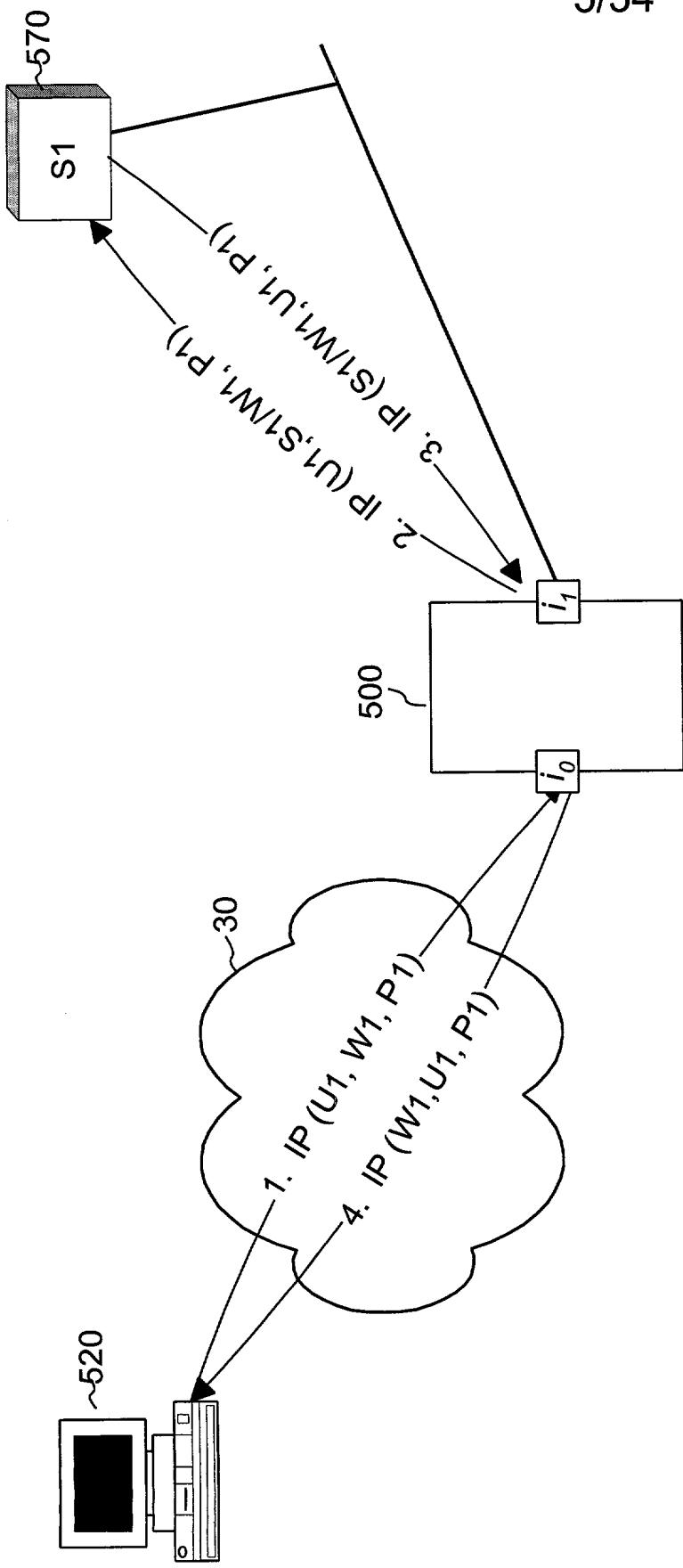


FIG. 5

STEP	FROM	TO	SOURCE IP	DESTINATION IP	SERVICE PORT
1	U1 (CLIENT)	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	S1 (SERVER)	U1	S1 (IF NAT IS REQUIRED); W1 (IF S1 SUPPORTS LOOPBACK OR ALIAS)	P1
3	S1	PACKETING ENGINE	S1 (IF NAT IS REQUIRED); W1 (IF S1 SUPPORTS LOOPBACK OR ALIAS)	U1	P1
4	PACKETING ENGINE	U1	W1	U1	P1

FIG. 5A

STEP	FROM	TO	SOURCE IP	DESTINATION IP	SERVICE PORT
1	U1	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	S1	U1	W1	P1
3	S1	PACKETING ENGINE	W1	U1	P1
4	PACKETING ENGINE	U1	W1	U1	P1

LOOPBACK
~570

FIG. 5C

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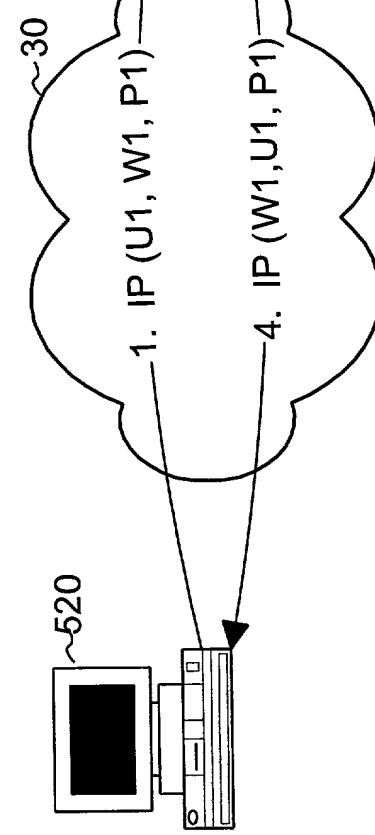
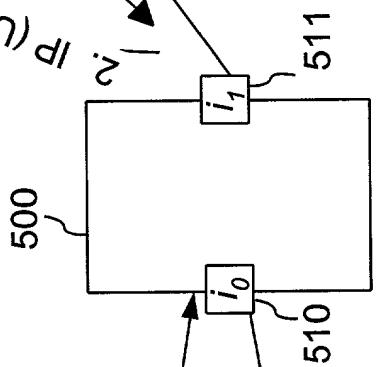


FIG. 5B

RECEIVE PACKET INBOUND TO PACKETING ENGINE				SEND IT OUTBOUND FROM PACKETING ENGINE			
RECEIVED ON INTERFACE	SOURCE ADDRESS	DEST. IP ADDRESS	SERVICE PORT	SEND FROM INTERFACE	DEST. SYSTEM TYPE	MAC	IP
I ₀	MAC	W1	P1	I ₁	LOOPBACK	S1 _M	W1
I ₁	S1 _M	W1	P1	I ₀	ROUTER	DEFAULT ROUTE	

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FIG. 5D

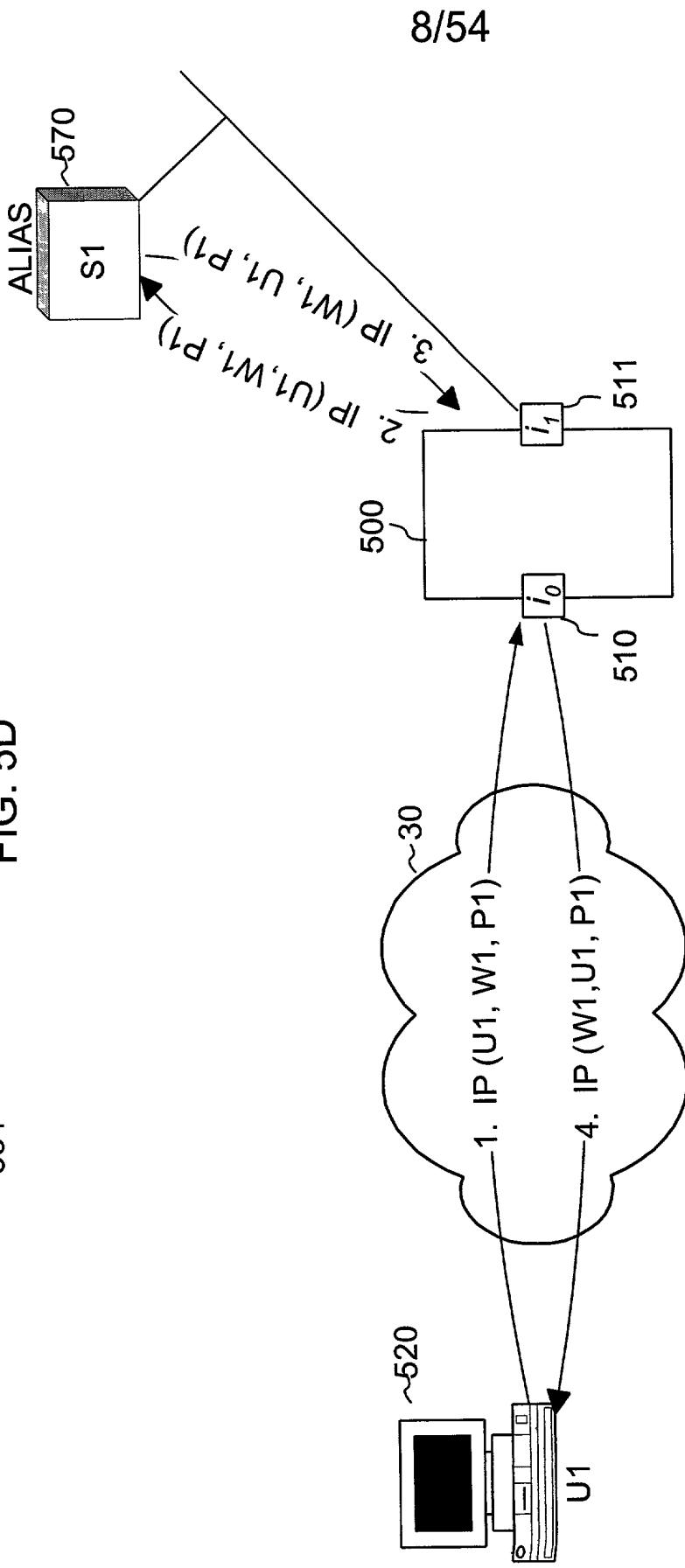


FIG. 5E

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STEP	FROM	TO	SOURCE IP	DESTINATION PORT	SERVICE PORT
1	U1	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	S1	U1	W1	P1
3	S1	PACKETING ENGINE	W1	U1	P1
4	PACKETING ENGINE	U1	W1	U1	P1

FIG. 5F

TABLE MAINTAINED BY PACKETING ENGINE					
RECEIVE PACKET INBOUND TO PACKETING ENGINE		SEND IT OUTBOUND FROM PACKETING ENGINE		SEND PACKET TO	
RCX ON INT.	SOURCE ADDRESS	DESTINATION IP ADDRESS	SERVICE PORT	SEND VIA INT.	DEST. SYSTEM TYPE
I ₀	MAC	W1	P1	I ₁	MAC
I ₁	S1 _M	W1	P1	I ₀	ROUTER
					DEFAULT ROUTE

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FIG. 5G

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STEP	FROM	TO	SOURCE IP	DESTINATION	SERVICE PORT
1	U1	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	S1	U1	S1	P1
3	S1	PACKETING ENGINE	S1	U1	P1
4	PACKETING ENGINE	U1	W1	U1	P1

FIG. 5I

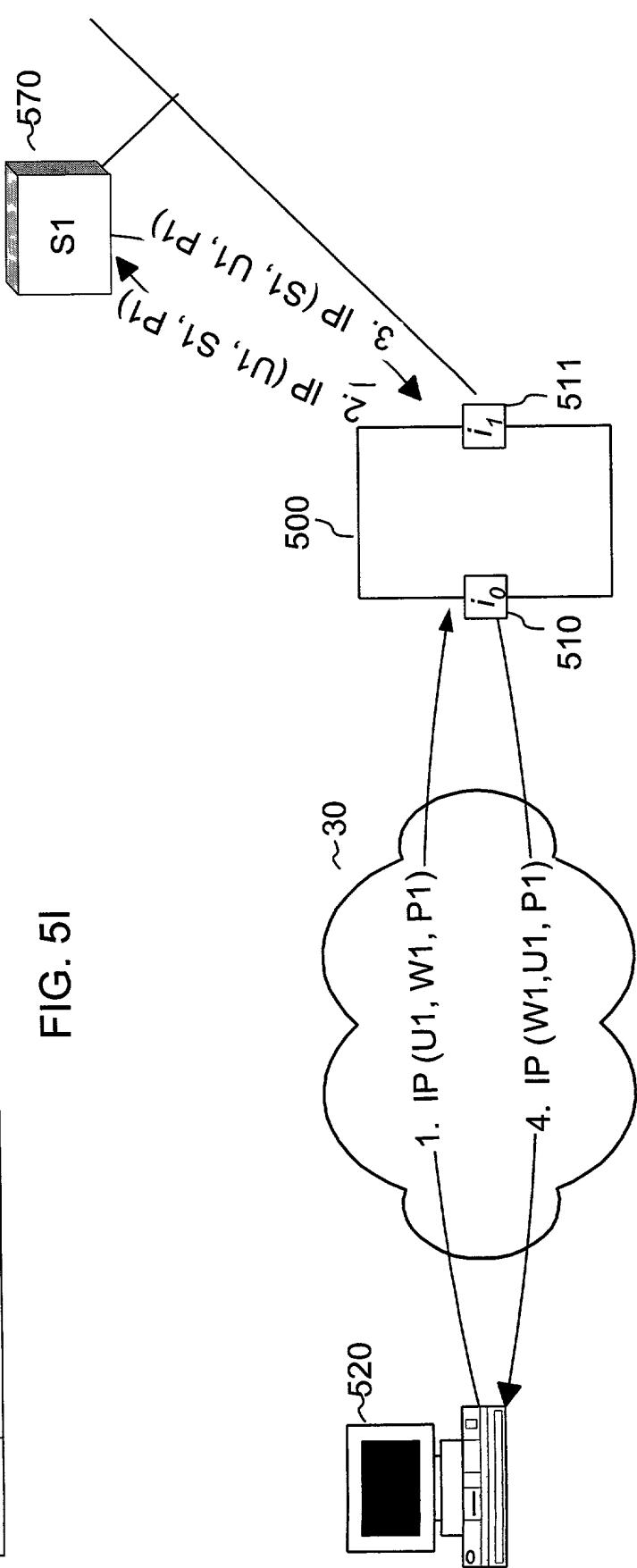


FIG. 5H

RECEIVE PACKET INBOUND TO PACKETTING ENGINE			SEND IT OUTBOUND FROM PACKETTING ENGINE		
RCX ON INT.	SOURCE IP ADDRESS	DESTINATION IP ADDRESS	SERVICE PORT	SEND VIA INT.	DEST. SYSTEM TYPE
I ₀		W ₁	P ₁	I ₁	NAT REQUIRED ROUTER
I ₁	S ₁			I ₀ (AFTER REVERSE NAT SOURCE IP TO W ₁)	DEFAULT ROUTE

FIG. 5J

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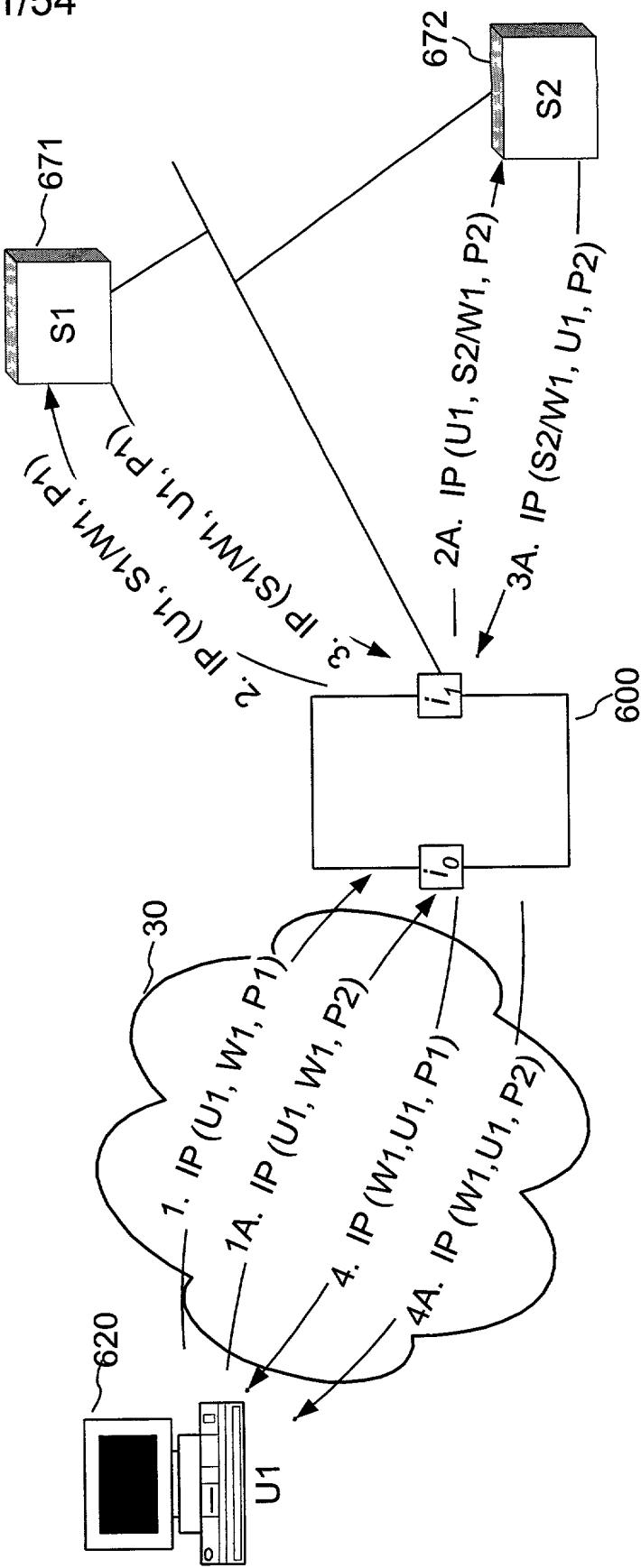


FIG. 6

STEP	FROM	TO	SOURCE IP	DESTINATION IP	PORT
			PORT P1	W1	P1
1	U1 (CLIENT)	PACKETING ENGINE	U1		
2	PACKETING ENGINE	S1 (SERVER)	U1	S1 (IF NAT IS REQUIRED); W1 (IF S1 SUPPORTS LOOPBACK OR ALIAS)	P1
3	S1	PACKETING ENGINE	S1 (IF NAT IS REQUIRED); W1 (IF S1 SUPPORTS LOOPBACK OR ALIAS)	U1	P1
4	PACKETING ENGINE	U1	W1	U1	P1
			PORT F2	W1	P2
1A	U1 (CLIENT)	PACKETING ENGINE	U1		
2A	PACKETING ENGINE	S2 (SERVER)	U1	S2 (IF NAT IS REQUIRED); W1 (IF S2 SUPPORTS LOOPBACK OR ALIAS)	P2
3A	S1	PACKETING ENGINE	S2 (IF NAT IS REQUIRED); W1 (IF S1 SUPPORTS LOOPBACK OR ALIAS)	U1	P2
4A	PACKETING ENGINE	U1	W1	U1	P2

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FIG. 6A

RECEIVE PACKET INBOUND TO PACKETING ENGINE				SEND IT OUTBOUND FROM PACKETING ENGINE			
RCX ON INT.	SOURCE IP ADDRESS	DEST. IP ADDRESS	SERVICE PORT	SEND VIA INT.	DEST. SYSTEM TYPE	SEND PACKET TO	IP
	MAC	IP				MAC	IP
I ₀		W1	P1	I ₁	LOOPBACK	S _{1M}	W1
I ₁	S _{1M}	W1	P1	I ₀	ALIAS	S _{1M}	W1
I ₀		W1	P2	I ₁	NAT	S ₁	
I ₁	S _{2M}	W1	P2	I ₀	ROUTER	DEFAULT ROUTE	
I ₀							
I ₁	S _{2M}	S ₂					

I₀ (AFTER REVERSE NAT SOURCE IP TO W1)
I₀ (AFTER REVERSE NAT SOURCE IP TO W1)

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FIG. 6B

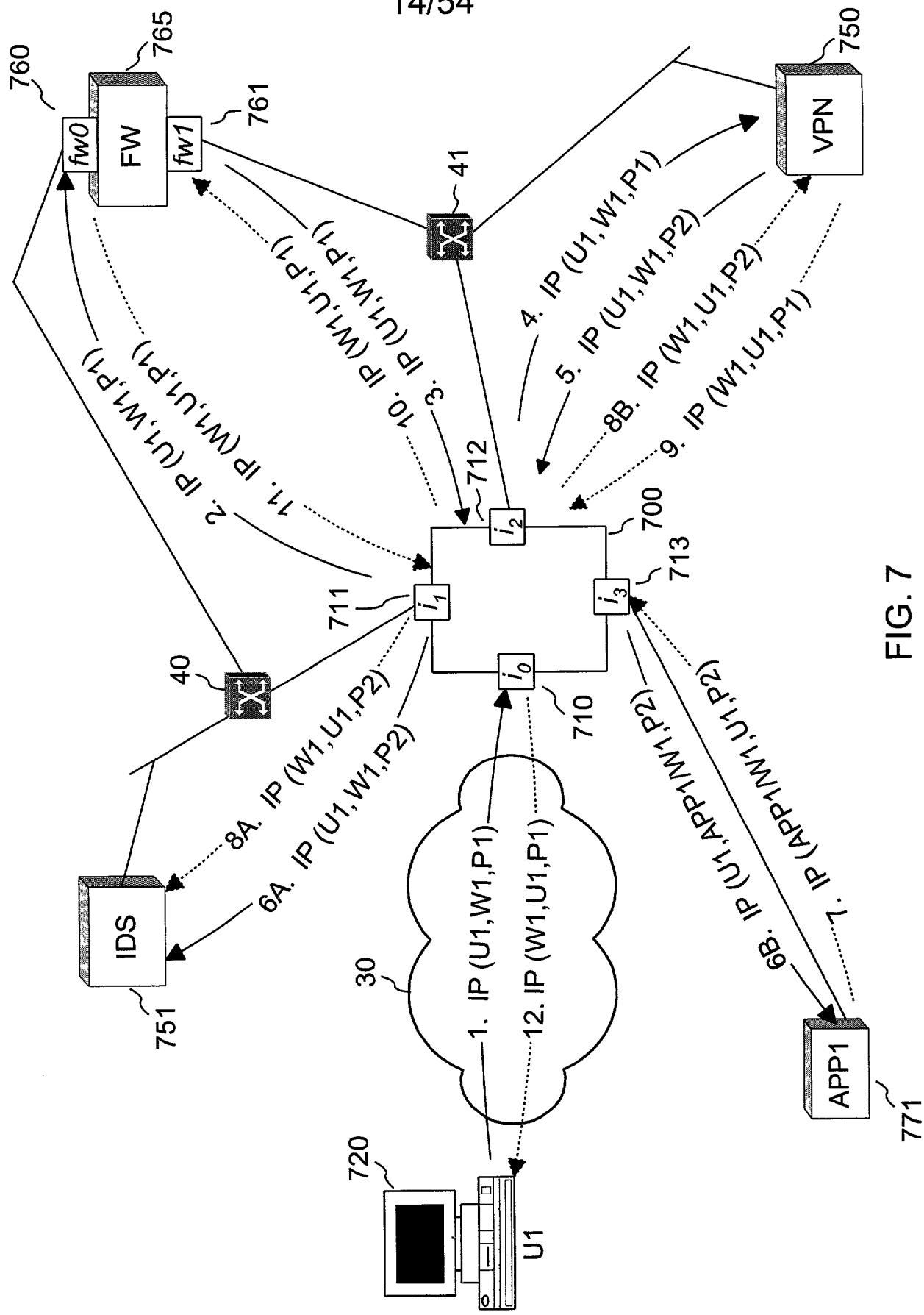


FIG. 7

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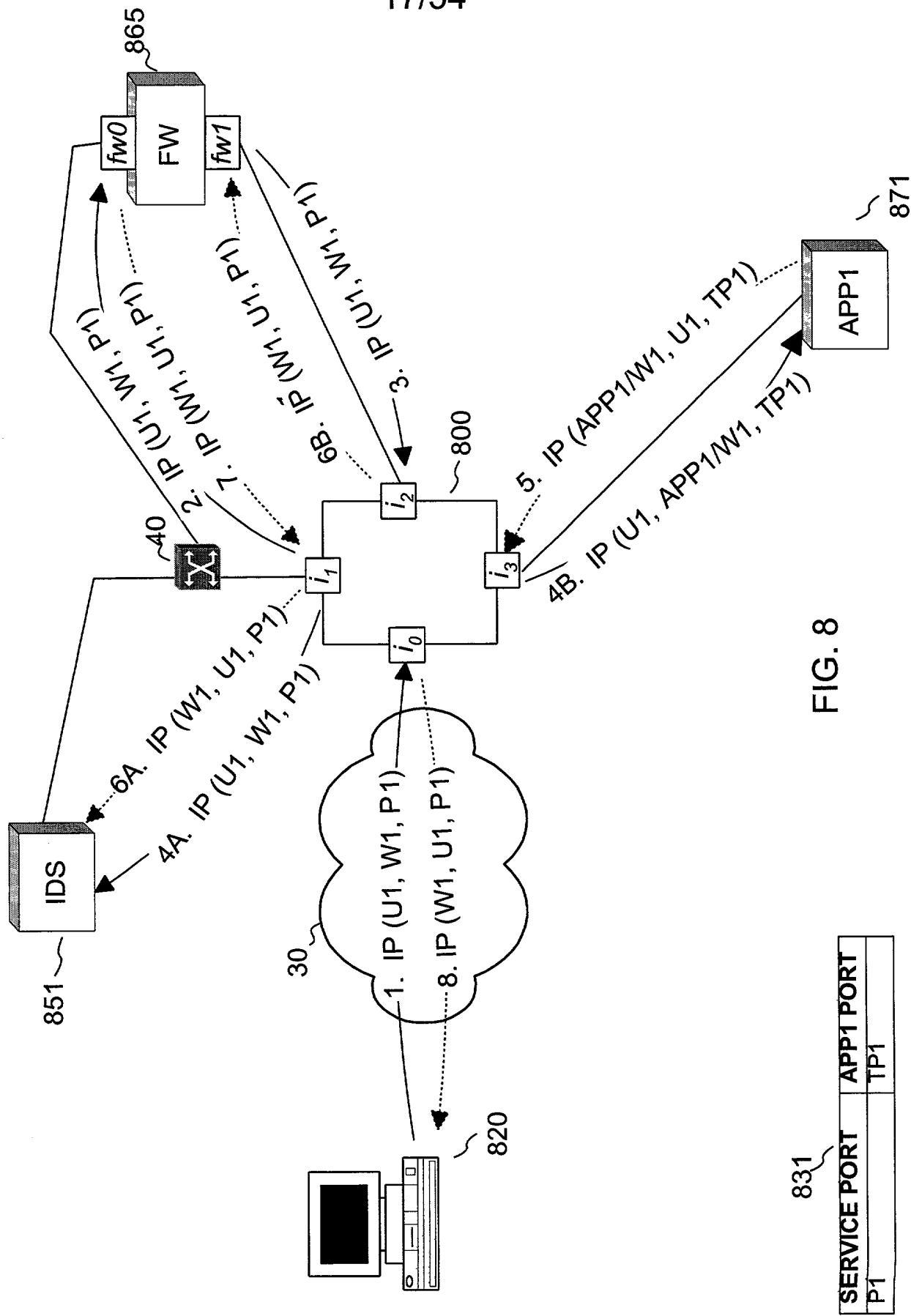
STEP	FROM	TO	SOURCE IP	DESTINATION IP	PORT
1	U1 (CLIENT)	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	FW (INTERFACE FW0)	U1	W1	P1
3	FW (INTERFACE FW1)	PACKETING ENGINE	U1	W1	P1
4	PACKETING ENGINE	VPN	U1	W1	P1
5	VPN	PACKETING ENGINE	U1	W1	P2
6A	PACKETING ENGINE	IDS	U1	W1	P2
6B	PACKETING ENGINE	APP1	U1	APP1 (IF NAT REQUIRED); W1 (IF LOOPBACK OR ALIAS SUPPORTED BY APP1)	P2
7	APP1	PACKETING ENGINE	U1	APP1 (IF NAT REQUIRED); W1 (IF LOOPBACK OR ALIAS SUPPORTED BY APP1)	P2
8A	PACKETING ENGINE	IDS	W1	U1	P2
8B	PACKETING ENGINE	VPN	W1	U1	P2
9	VPN	PACKETING ENGINE	W1	U1	P1
10	PACKETING ENGINE	FW (INTERFACE FW1)	W1	U1	P1
11	FW (INTERFACE FW0)	PACKETING ENGINE	W1	U1	P1
12	PACKETING ENGINE	U1	W1	U1	P1

FIG. 7A

RECEIVE PACKET INBOUND TO PACKETTING ENGINE				SEND IT OUTBOUND FROM PACKETTING ENGINE			
RCX ON INT.	SOURCE ADDRESS	DEST. IP ADDRESS	SERVICE PORT	SEND VIA INT.	DEST. SYSTEM TYPE	SEND PACKET TO	
	MAC	IP				MAC	IP
I ₀		W1	P1	I ₁	TRANSPARENT	FW0 _M	W1
I ₂	FW1 _M	W1	P1	I ₂	TRANSPARENT	VPN _M	W1
I ₂	VPN _M	W1	P2	I ₁	TRANSPARENT	IDS _M	W1
				I ₃	LOOPBACK	APP1 _M	W1
					ALIAS	APP1 _M	W1
					NAT	APP1 _M	APP1
I ₁	IDS _M		P2	I ₃	LOOPBACK	APP1 _M	W1
					ALIAS	APP1 _M	W1
					NAT	APP1 _M	APP1
I ₃	APP1 _M	APP1 OR W1	P2	I ₁	TRANSPARENT	IDS _M	
				I ₂	TRANSPARENT	VPN _M	
I ₂	VPN _M	W1	P1	I ₂	TRANSPARENT	FW1 _M	
I ₁	FW0 _M	W1	P1	I ₀	ROUTER	DEFAULT ROUTE	

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FIG. 7B



STEP	FROM	TO	SOURCE IP	DESTINATION IP	SERVICE PORT
1	U1 (CLIENT)	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	FW (INTERFACE FW0)	U1	W1	P1
3	FW (INTERFACE FW1)	PACKETING ENGINE	U1	W1	P1
4A	PACKETING ENGINE	IDS	U1	W1	P1
4B	PACKETING ENGINE	APP1	U1	APP1 (IF NAT REQUIRED); W1 (IF LOOPBACK OR ALIAS SUPPORTED BY APP1)	TP1
5	APP1	PACKETING ENGINE	APP1 (IF NAT REQUIRED); W1 (IF LOOPBACK OR ALIAS SUPPORTED BY APP1)	U1	TP1
6A	PACKETING ENGINE	IDS	V1	U1	P1
6B	PACKETING ENGINE	FW (INTERFACE FW1)	V1	U1	P1
7	FW (INTERFACE FW0)	PACKETING ENGINE	V1	U1	P1
8	PACKETING ENGINE	U1	V1	U1	P1

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FIG. 8B

RECEIVE PACKET INBOUND TO PACKETTING ENGINE				SEND IT OUTBOUND FROM PACKETTING ENGINE			
RCX ON INT.	SOURCE ADDRESS	DEST. IP ADDRESS	SERVICE PORT	SEND VIA INT.	DEST. SYSTEM TYPE	SEND PACKET TO	PORT
	MAC	IP			MAC	IP	
I ₀	FW _M	W1	P1	I ₁	TRANSPARENT	FV0 _M	W1
I ₂		W1	P1	I ₁	TRANSPARENT	IDSM _M	W1
				I ₃	LOOPBACK	APP1 _M	W1
					ALIAS	APP1 _M	TP1
					NAT	APP1 _M	TP1
I ₁	IDSM _M		P1	I ₃	LOOPBACK	APP1 _M	TP1
					ALIAS	APP1 _M	TP1
					NAT	APP1 _M	TP1
I ₃	APP1 _M	APP1 OR W1	TP1	I ₁	TRANSPARENT	IDSM _M	P1
				I ₂	TRANSPARENT	FV1 _M	P1
I ₁	FW _M	W1	P1	I ₀	ROUTER	DEFAULT ROUTE	P1

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FIG. 8C

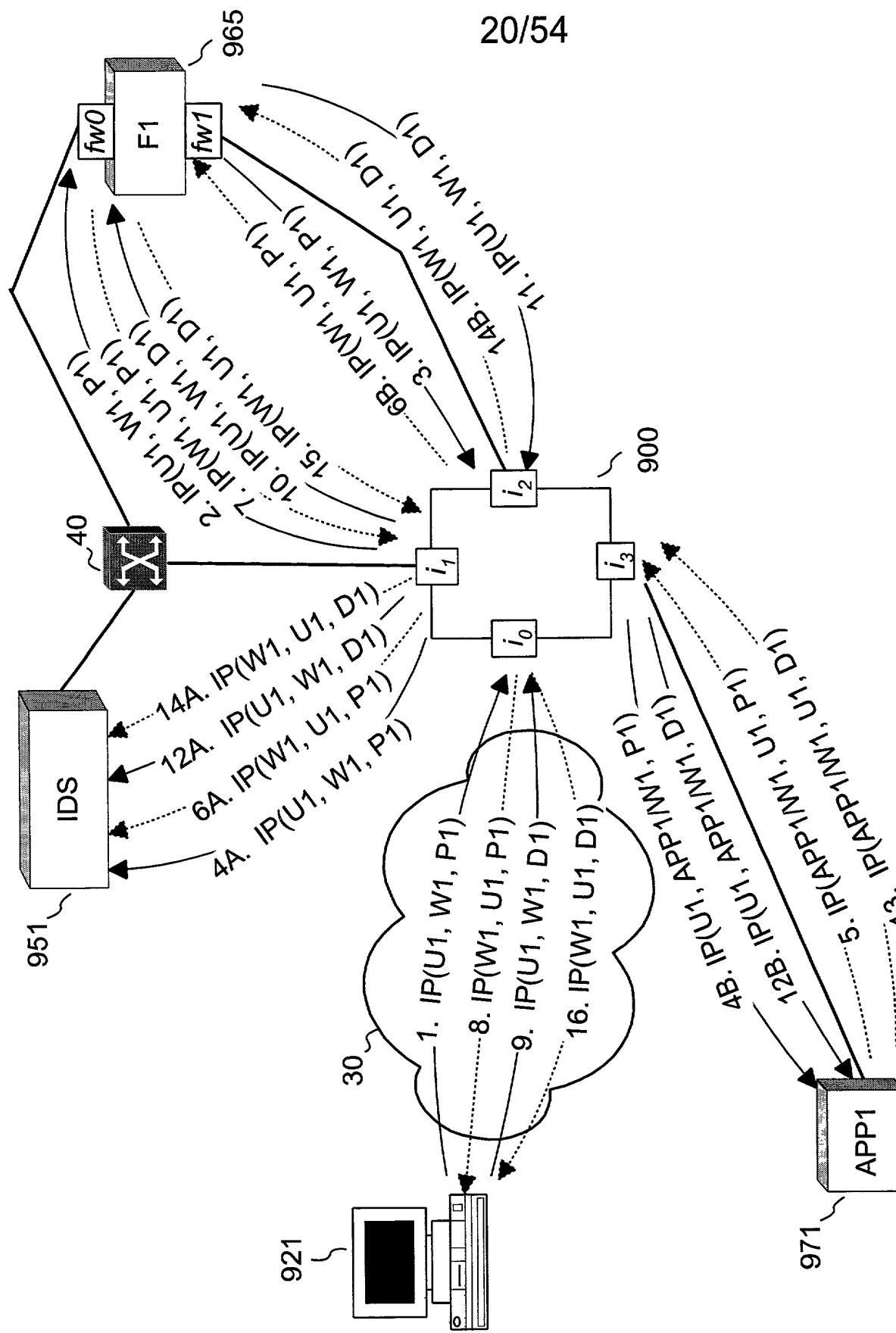


FIG. 9

STEP	FROM	TO	SOURCE IP	DESTINATION IP	PORT
1	U1 (CLIENT)	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	FIREWALL F1 (INT. FW0)	U1	W1	P1
3	FIREWALL F1 (INT. FW1)	PACKETING ENGINE	U1	W1	P1
4A	PACKETING ENGINE	IDS	U1	W1	P1
4B	PACKETING ENGINE	APP1	U1	APP1 (IF NAT); W1 (IF LOOPBACK OR ALIAS)	P1
5	APP1	PACKETING ENGINE	APP1 (IF NAT); W1 (IF LOOPBACK OR ALIAS)	U1	P1
6A	PACKETING ENGINE	IDS	V1	U1	P1
6B	PACKETING ENGINE	FIREWALL F1 (INT. FW1)	V1	U1	P1
7	FIREWALL F1 (INT. FW0)	PACKETING ENGINE	V1	U1	P1
8	PACKETING ENGINE	U1	V1	U1	P1
9	U1 (CLIENT)	PACKETING ENGINE	U1	V1	D1
10	PACKETING ENGINE	FIREWALL F1 (INT. FW0)	U1	V1	D1
11	FIREWALL F1 (INT. FW1)	PACKETING ENGINE	U1	V1	D1
12A	PACKETING ENGINE	IDS	U1	V1	D1
12B	PACKETING ENGINE	APP1	U1	APP1 (IF NAT); W1 (IF LOOPBACK OR ALIAS)	D1
13	APP1	PACKETING ENGINE	APP1 (IF NAT); W1 (IF LOOPBACK OR ALIAS)	U1	D1
14A	PACKETING ENGINE	IDS	W1	U1	D1
14B	PACKETING ENGINE	FIREWALL F1 (INT. FW1)	W1	U1	D1
15	FIREWALL F1 (INT. FW0)	PACKETING ENGINE	W1	U1	D1
16	PACKETING ENGINE	U1	W1	U1	D1

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FIG. 9A

RECEIVE PACKET INBOUND TO PACKETTING ENGINE				SEND IT OUTBOUND FROM PACKETTING ENGINE			
RCX ON INT.	SOURCE ADDRESS	DEST. IP ADDRESS	SERVICE PORT	SEND VIA INT.	DEST. SYSTEM TYPE	SEND PACKET TO	
MAC	IP	MAC	IP	MAC	IP	MAC	IP
I ₀		V1	P1 OR PORT IN RANGE OF 1025→1125	I ₁	TRANSPARENT	FW0 _M	W1
I ₂	FW1 _M	V1	P1 OR PORT IN RANGE OF 1025→1125	I ₃	TRANSPARENT	IDS _M	W1
I ₁	IDS _M		P1 OR PORT IN RANGE OF 1025→1125	I ₃	LOOPBACK	APP1 _M	W1
I ₃	APP1 _M	APP1 OR W1	P1 OR PORT IN RANGE OF 1025→1125	I ₁	TRANSPARENT	NAT	APP1
I ₁	FW2 _M	W1	P1 OR PORT IN RANGE OF 1025→1125	I ₀	ROUTER	FW1 _M	DEFAULT ROUTE

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FIG. 9B

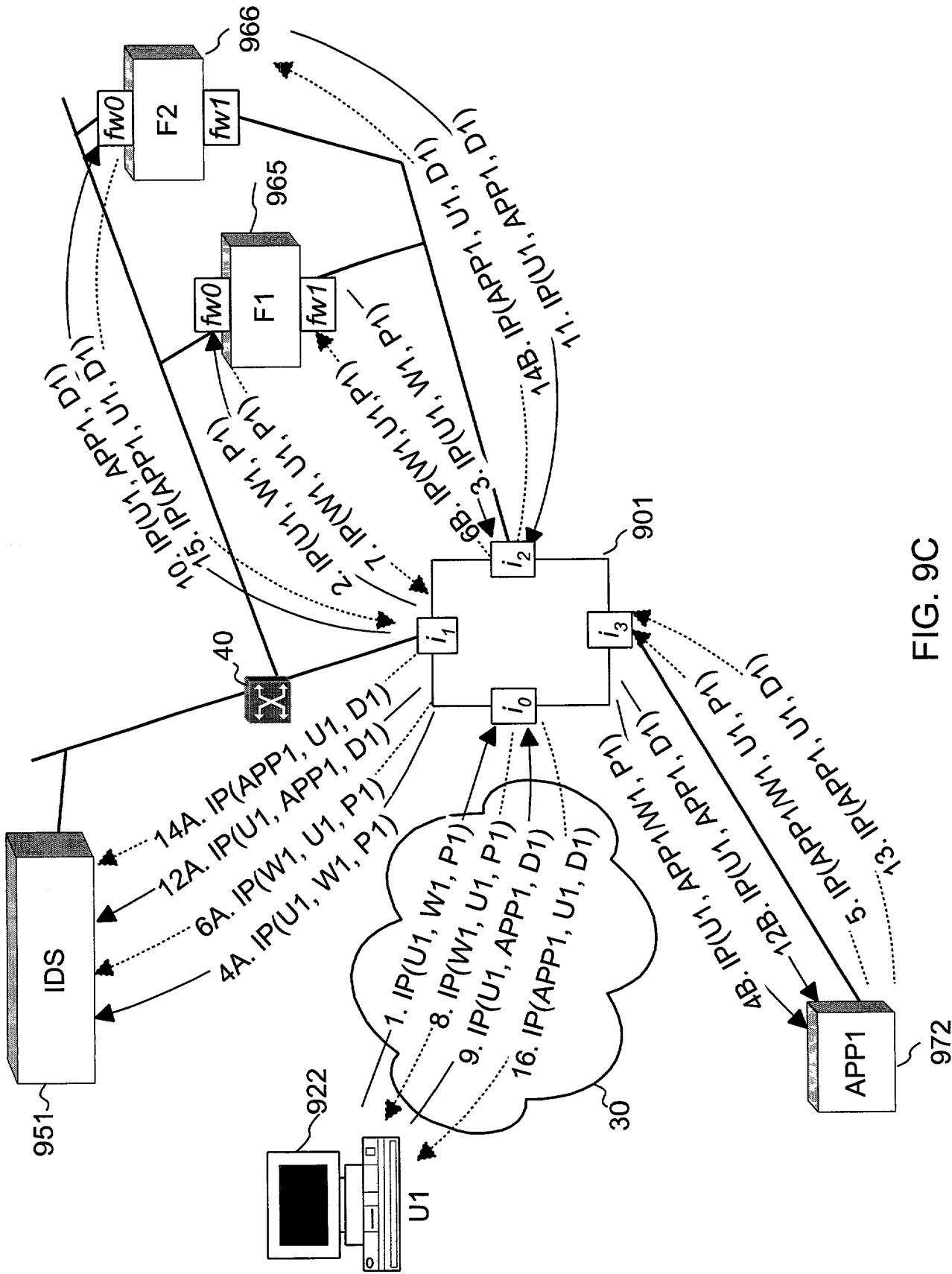


FIG. 9C

STEP	FROM	TO	SOURCE IP	DESTINATION IP	PORT
1	U1 (CLIENT)	PACKETING ENGINE	U1	W1	P1
2	PACKETING ENGINE	F1 (INT. FW0)	U1	W1	P1
3	F1 (INT. FW1)	PACKETING ENGINE	U1	W1	P1
4A	PACKETING ENGINE	IDS	U1	W1	P1
4B	PACKETING ENGINE	APP1	U1	APP1 (IF NAT REQUIRED); W1 (IF LOOPBACK OR ALIAS SUPPORTED BY APP1)	P1
5	APP1	PACKETING ENGINE	APP1 (IF NAT REQUIRED); W1 (IF LOOPBACK OR ALIAS SUPPORTED BY APP1)	U1	P1
6A	PACKETING ENGINE	IDS	W1	U1	P1
6B	PACKETING ENGINE	F1 (INT. FW1)	W1	U1	P1
7	F1 (INT. FW0)	PACKETING ENGINE	W1	U1	P1
8	PACKETING ENGINE	U1	W1	U1	P1
9	U1 (CLIENT)	PACKETING ENGINE	U1	APP1	D1
10	PACKETING ENGINE	F2 (INT. FW0)	U1	APP1	D1
11	F2 (INT. FW1)	PACKETING ENGINE	U1	APP1	D1
12A	PACKETING ENGINE	IDS	U1	APP1	D1
12B	PACKETING ENGINE	APP1	U1	APP1	D1
13	APP1	PACKETING ENGINE	APP1	U1	D1
14A	PACKETING ENGINE	IDS	APP1	U1	D1
14B	PACKETING ENGINE	F2 (INT. FW1)	APP1	U1	D1
15	F2 (INT. FW0)	PACKETING ENGINE	APP1	U1	D1
16	PACKETING ENGINE	U1	APP1	U1	D1

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FIG. 9D

RECEIVE PACKET INBOUND TO PACKETTING ENGINE				SEND IT OUTBOUND FROM PACKETTING ENGINE			
RCX ON INT.	SOURCE ADDRESS	DEST. IP ADDRESS	SERVICE PORT	VIA INT.	SEND DEST. SYSTEM TYPE		SEND PACKET TO IP
MAC	IP	MAC	IP	MAC	IP	MAC	IP
I ₀	F1(FW1) _M	W1	P1	I ₁	TRANSPARENT	F1(FW0) _M	W1
I ₂		W1	P1	I ₁	TRANSPARENT	IDS _M	W1
				I ₃	LOOPBACK	APP1 _M	W1
					ALIAS	APP1 _M	W1
					NAT		APP1
I ₁	IDS _M		P1	I ₃	LOOPBACK	APP1 _M	W1
					ALIAS	APP1 _M	W1
					NAT		APP1
I ₃	APP1 _M	APP1 OR W1	P1	I ₁	TRANSPARENT	IDS _M	
				I ₂	TRANSPARENT	F1(FW1) _M	
I ₁	F1(FW0) _M	W1	P1	I ₀	ROUTER		DEFAULT ROUTE
I ₀		APP1	PORT>1024	I ₁	TRANSPARENT	F2(FW0) _M	APP1
I ₂	F2(FW1) _M	APP1	PORT>1024	I ₁	TRANSPARENT	IDS _M	APP1
				I ₃	SERVER IP ADDRESS	APP1 _M	APP1
I ₁	IDS _M		PORT>1024	I ₃	SERVER IP ADDRESS	APP1 _M	APP1
I ₃	APP1 _M	APP1	PORT>1024	I ₁	TRANSPARENT	IDS _M	
I ₁	F2(FW0) _M	APP1	PORT>1024	I ₂	TRANSPARENT	F2(FW1) _M	DEFAULT ROUTE

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FIG. 9E

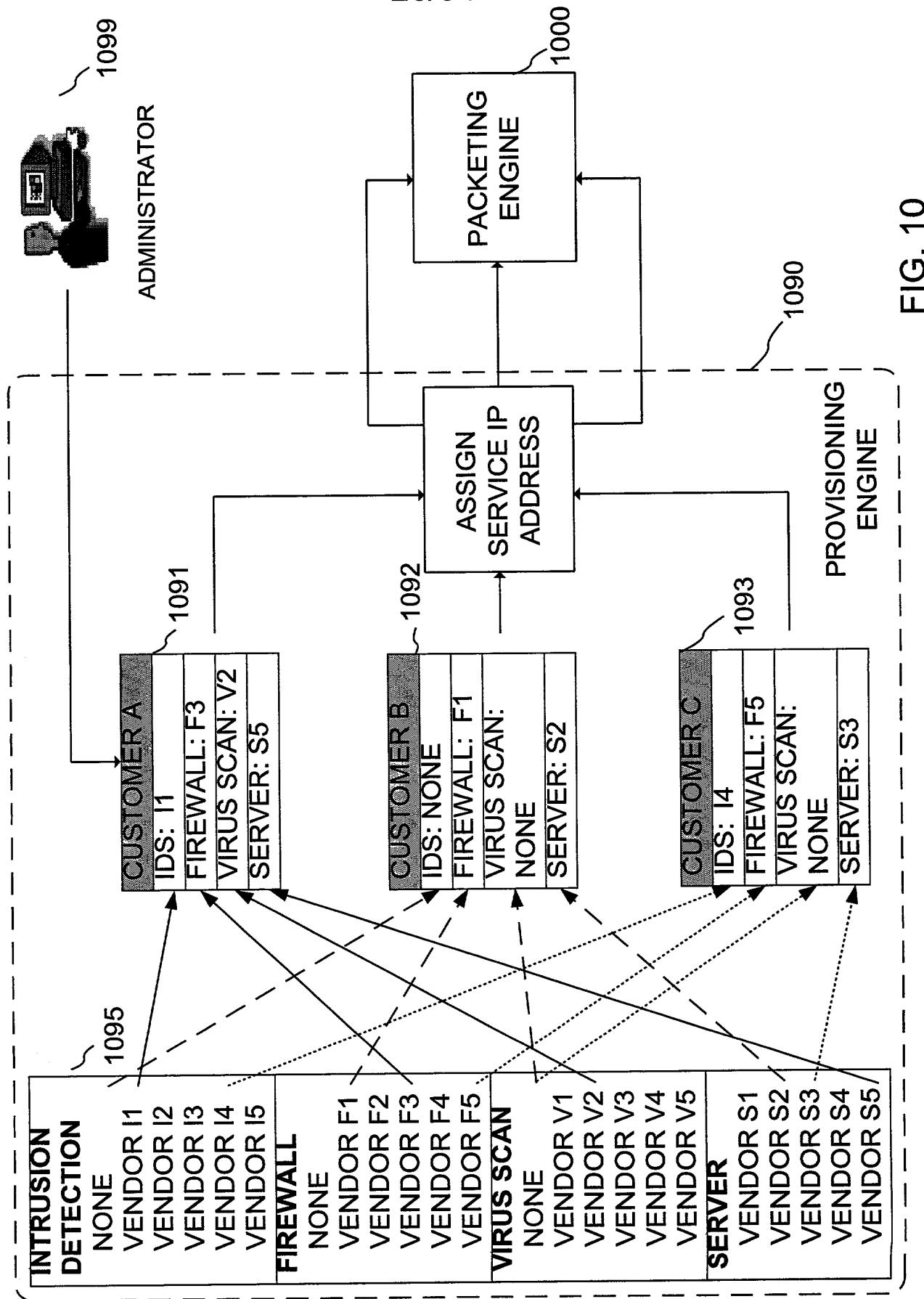


FIG. 10

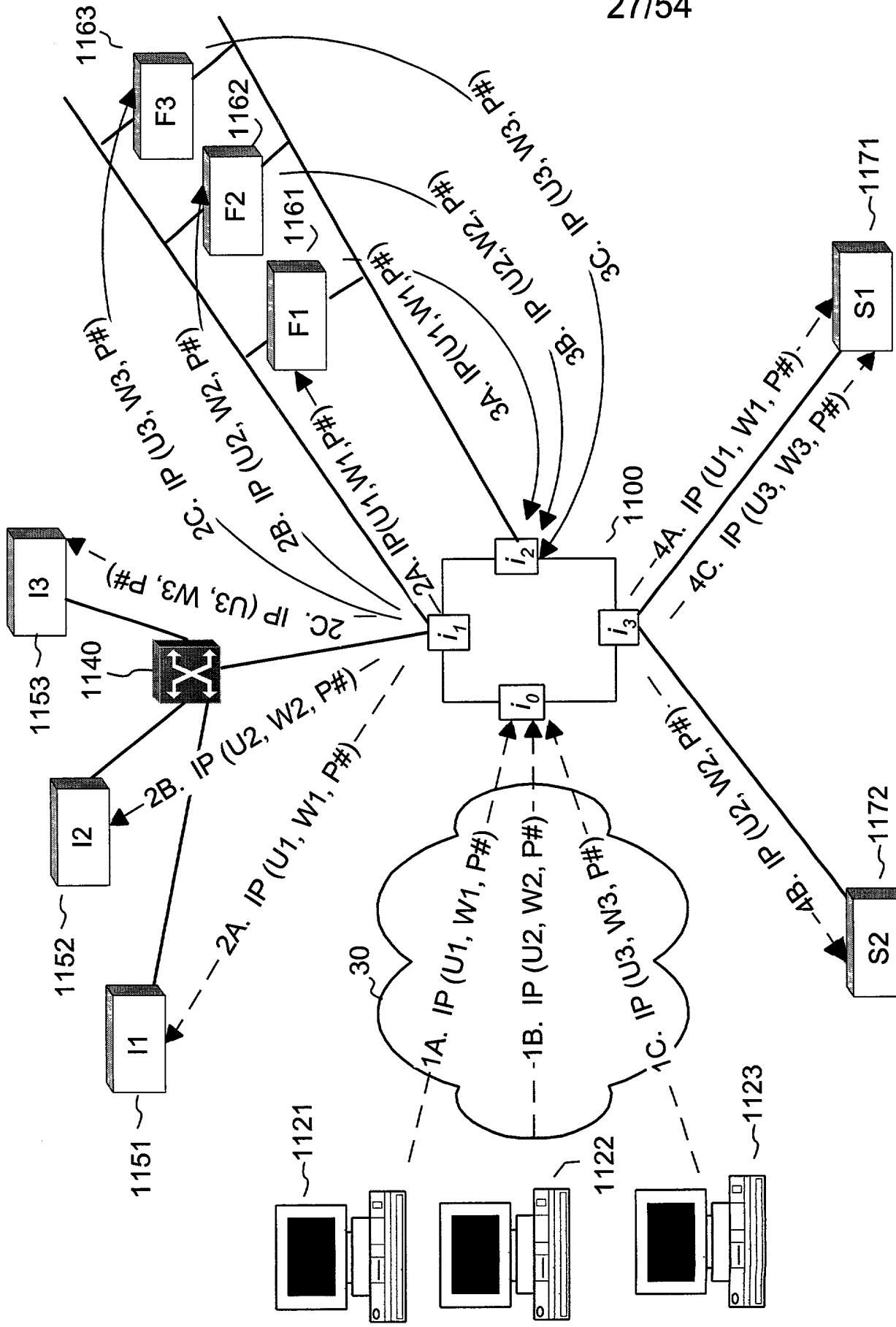


FIG. 11

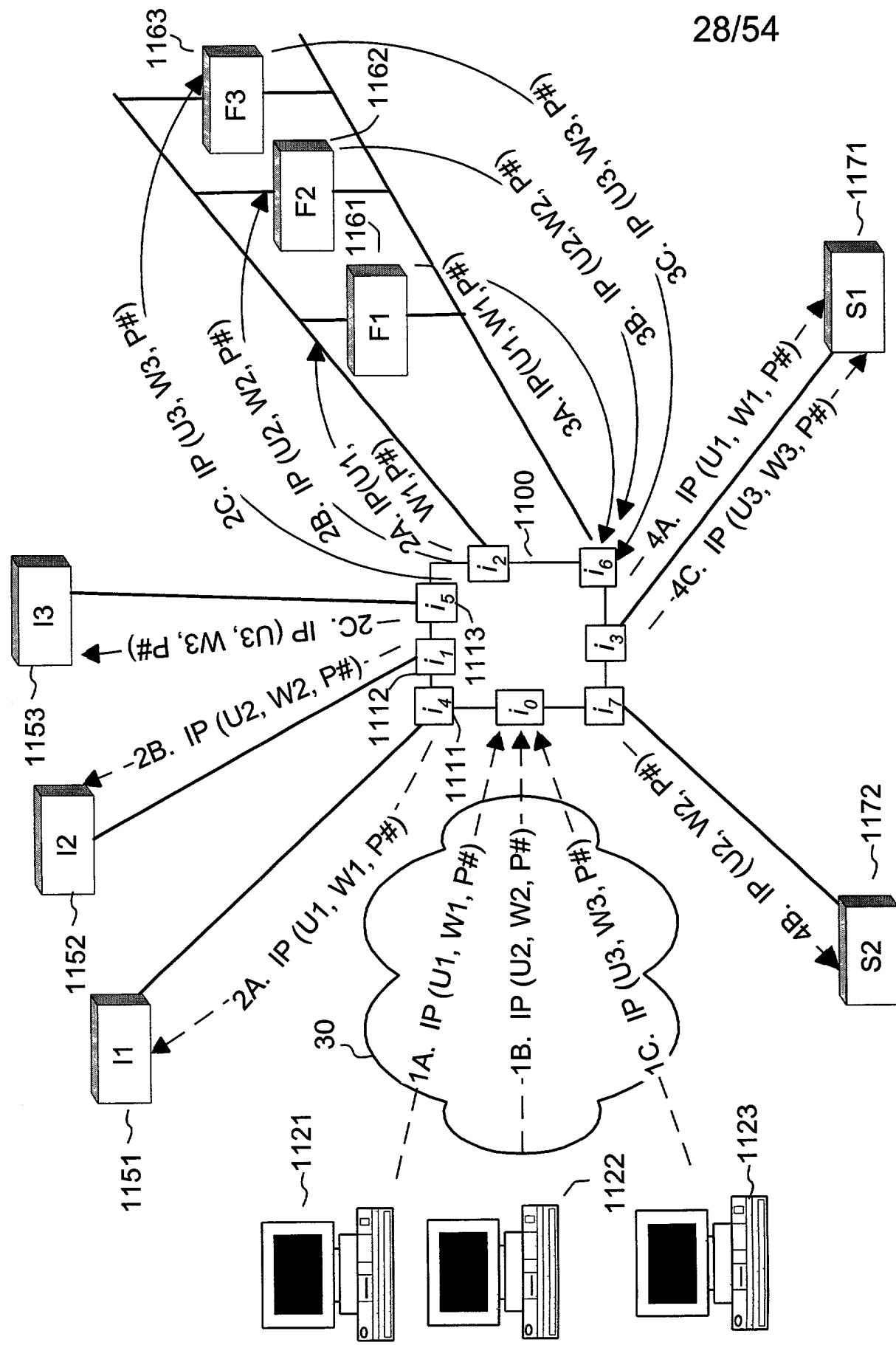


FIG. 11A

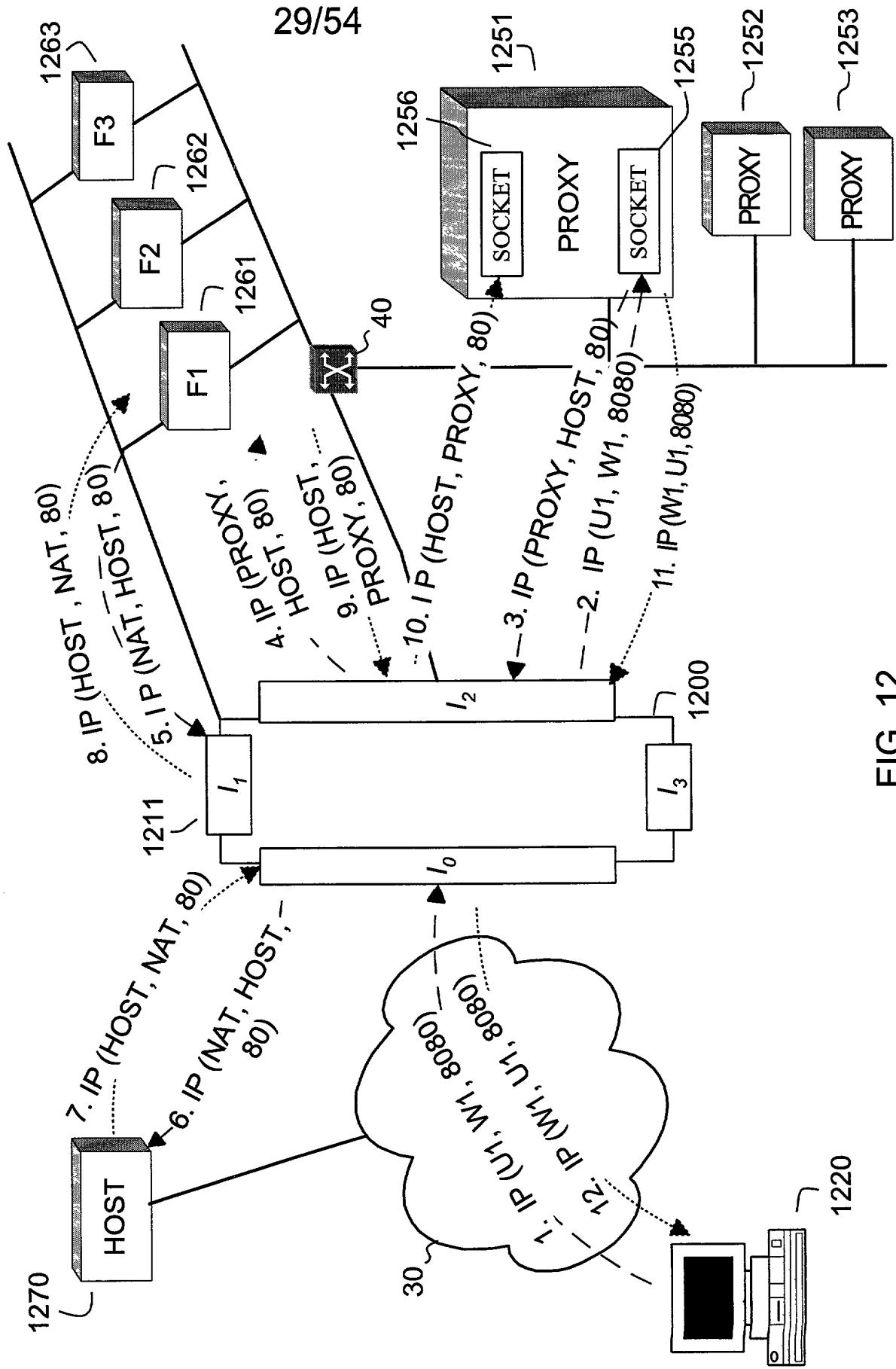


FIG. 12

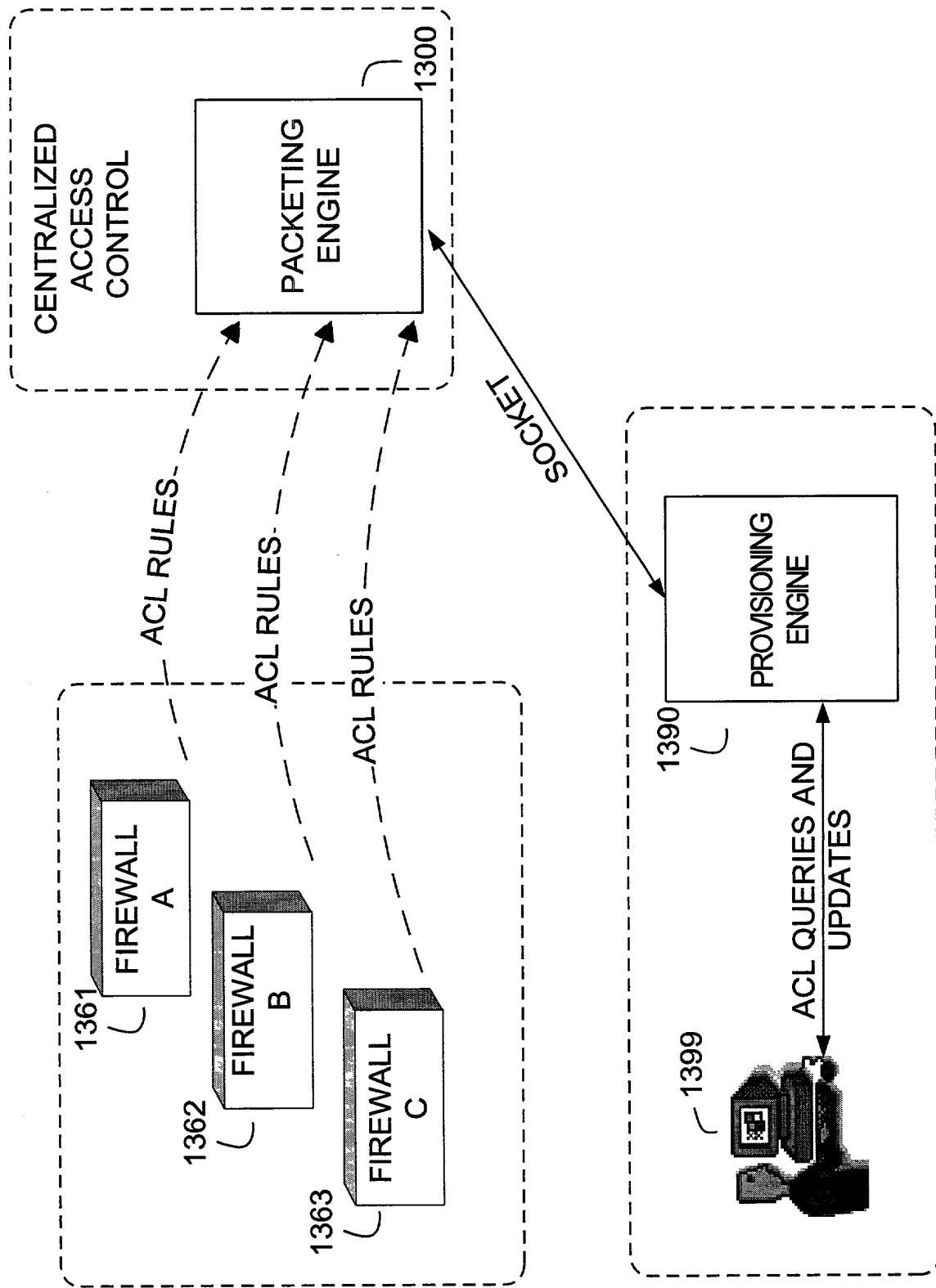


FIG. 13

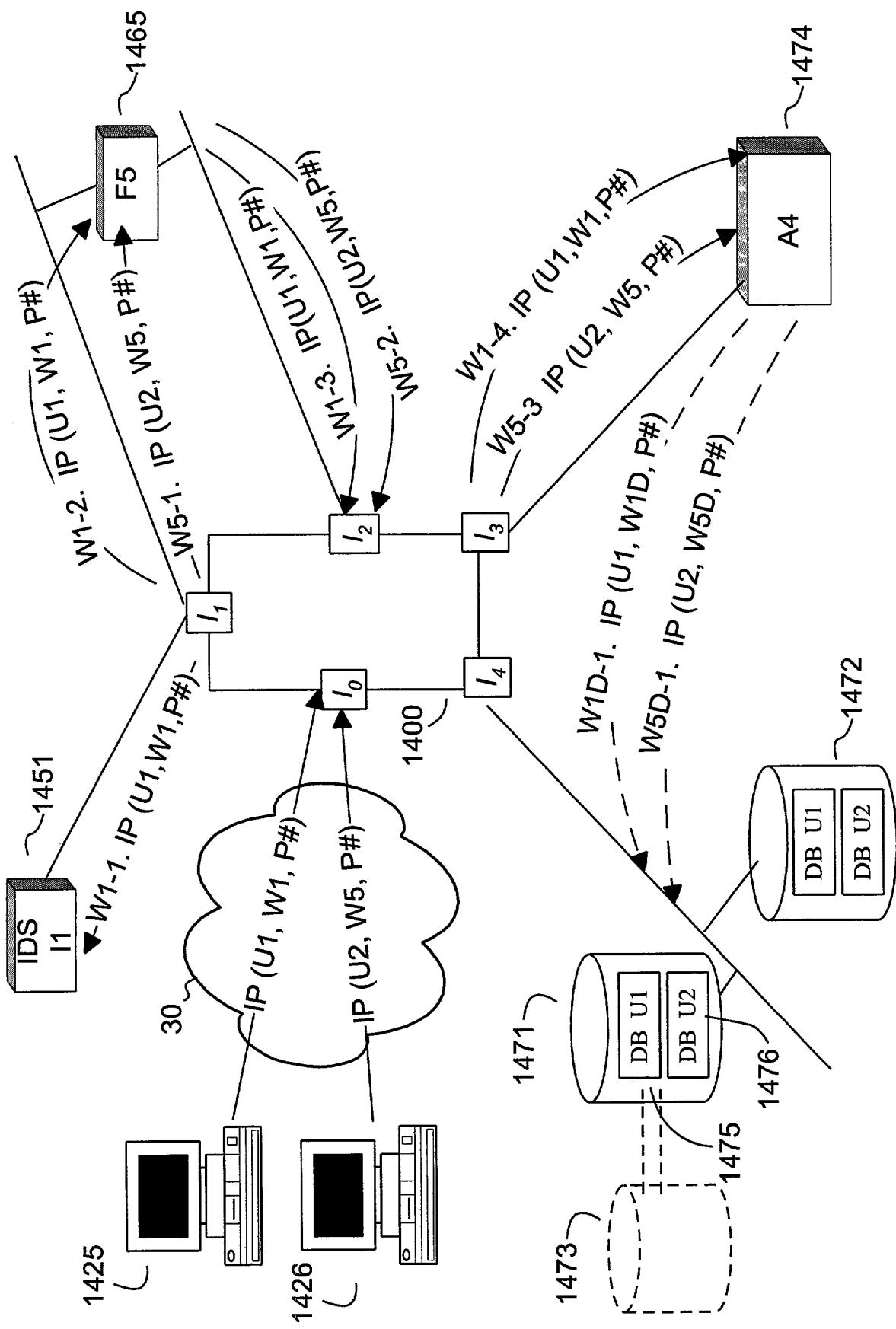


FIG. 14

SERVICE IP ADDRESS W1

STEP W1-1	INTRUSION DETECTION	I1
STEP W1-2/3	FIREWALL	F5
STEP W1-4	APPLICATION SERVER	A4

FIG. 14A
└1431

SERVICE IP ADDRESS W5

STEP W5-1/2	FIREWALL	F5
STEP W5-3	APPLICATION SERVER	A4

FIG. 14B
└1432

SERVICE IP ADDRESS W1D

STEP W1D-1	DATABASE SERVER	D1
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FIG. 14C
└1433

SERVICE IP ADDRESS W5D

STEP W5D-1	DATABASE SERVER	D1
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FIG. 14D
└1434

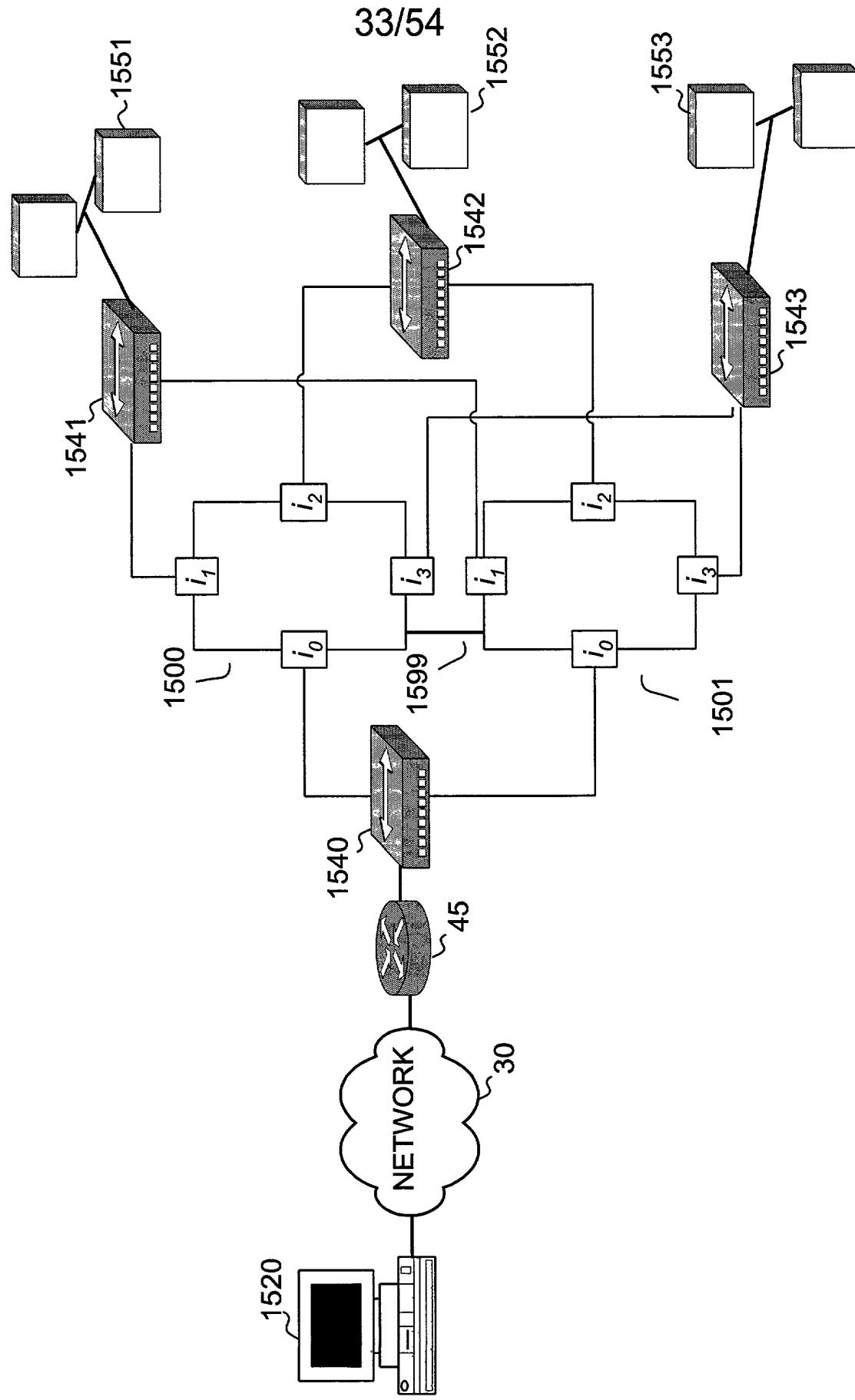


FIG. 15

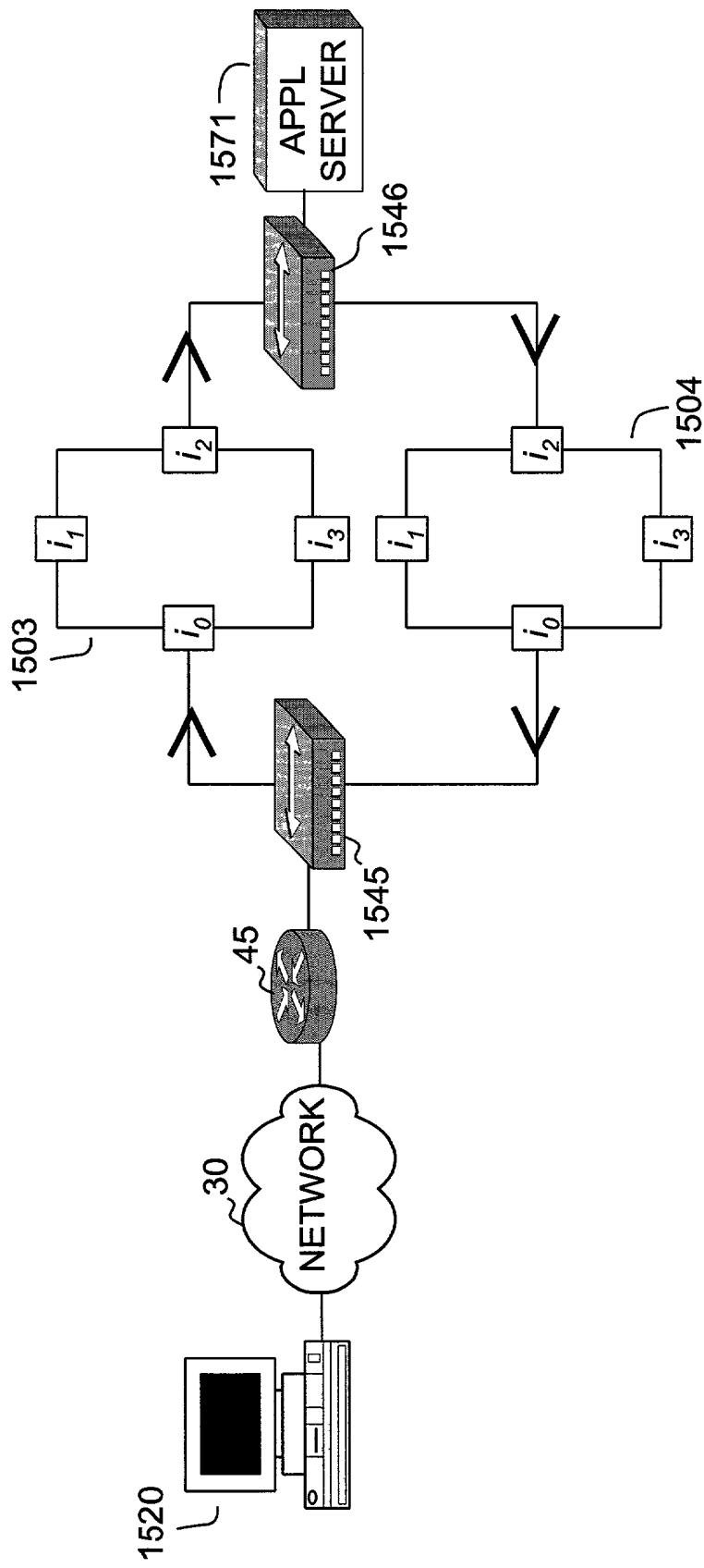


FIG. 15A

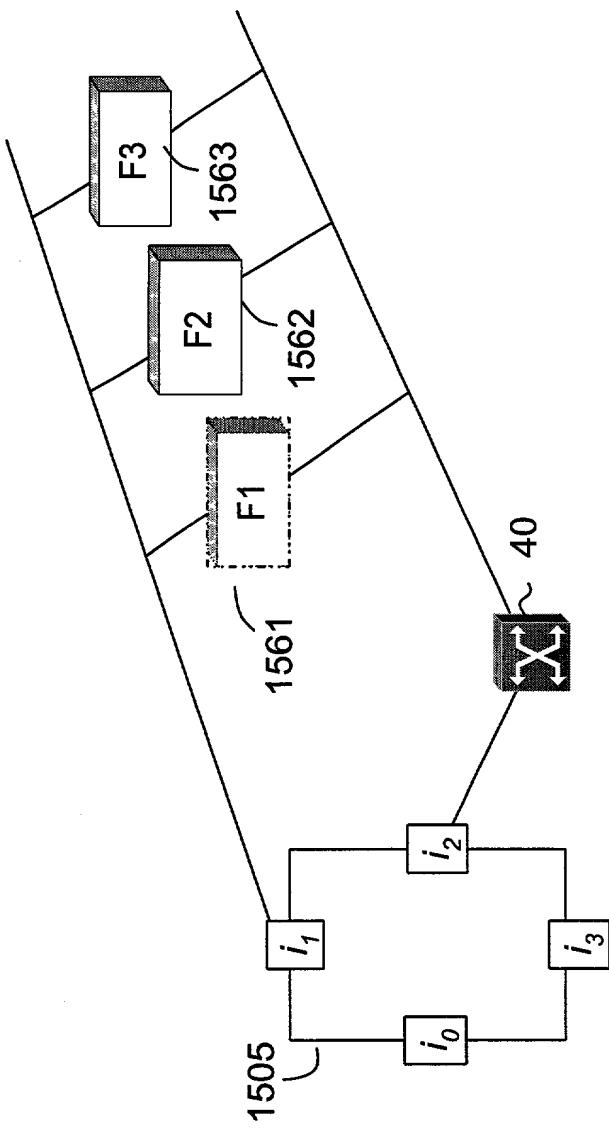


FIG. 15B

SEND IT OUTBOUND FROM PACKETING ENGINE			
SEND FROM INTERFACE	DEST. SYSTEM TYPE	SEND PACKET TO	
i1	TRANSPARENT	FIREWALL F1 _M	W1
i1	TRANSPARENT	FIREWALL F2 _M	W1
			1533

FIG. 15C

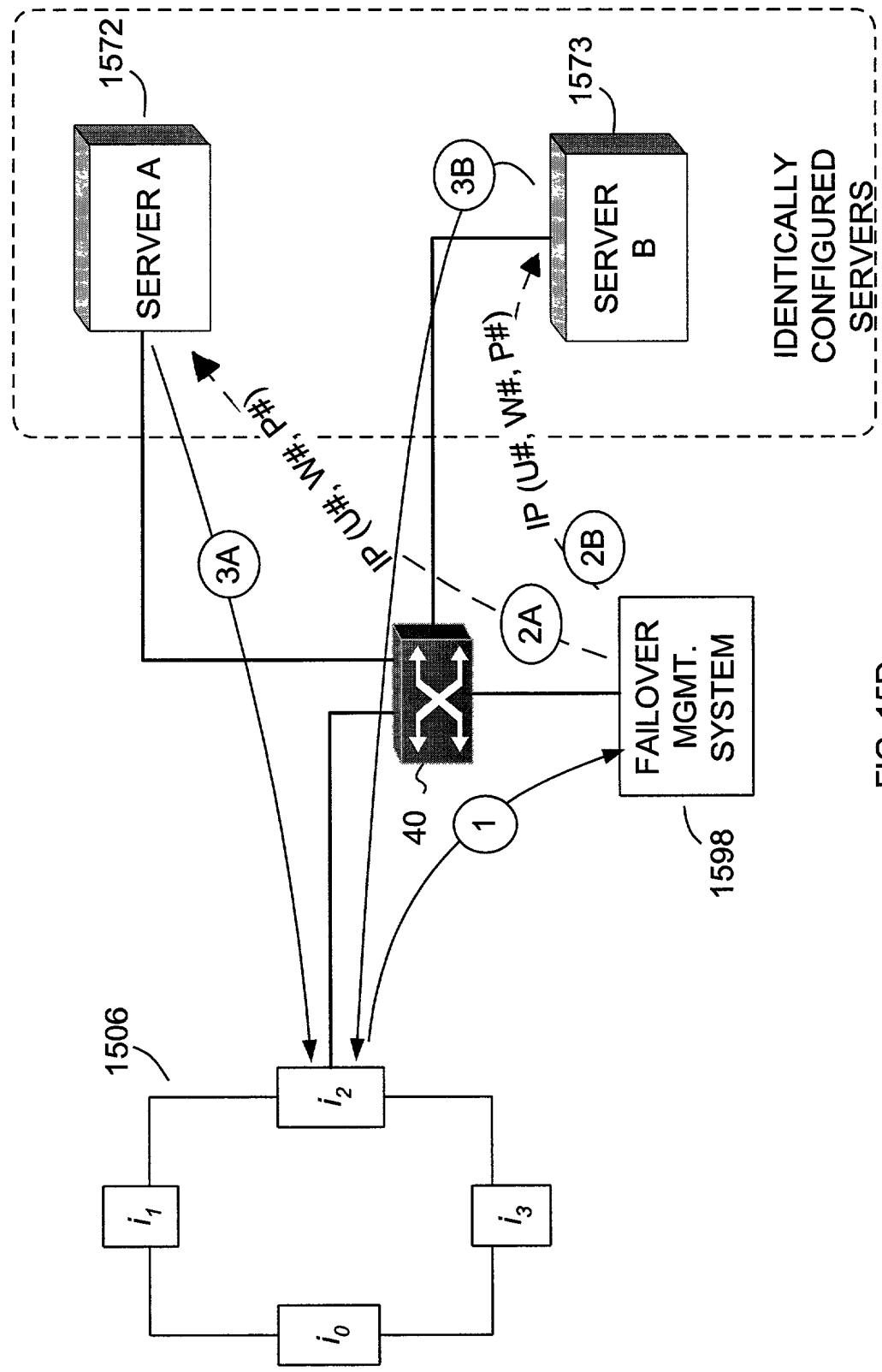


FIG. 15D

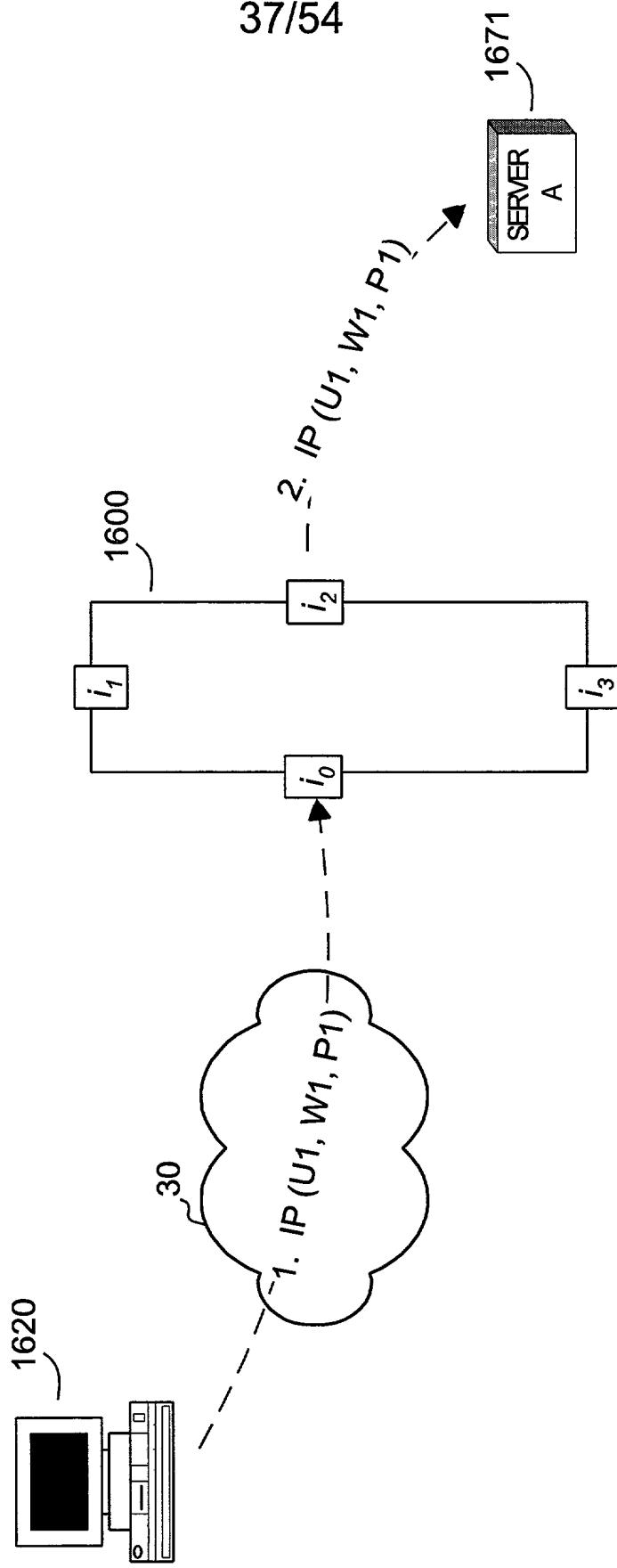


FIG. 16

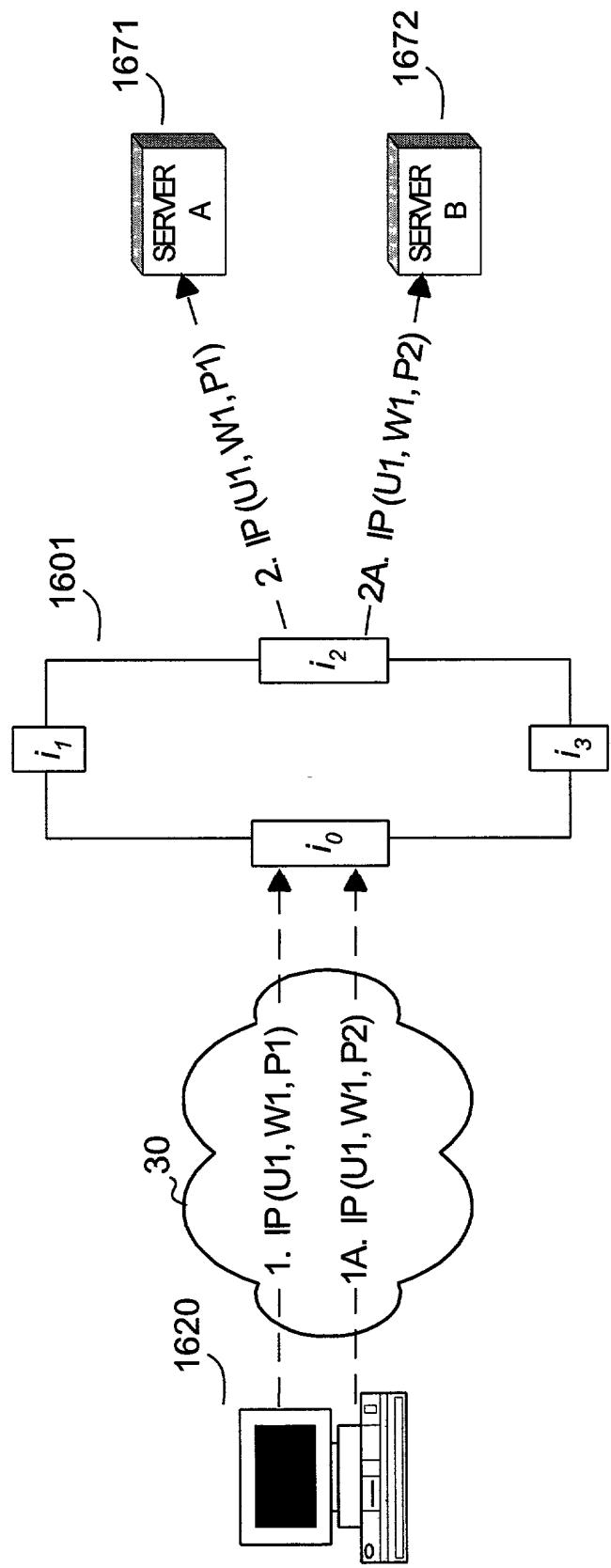


FIG. 16A

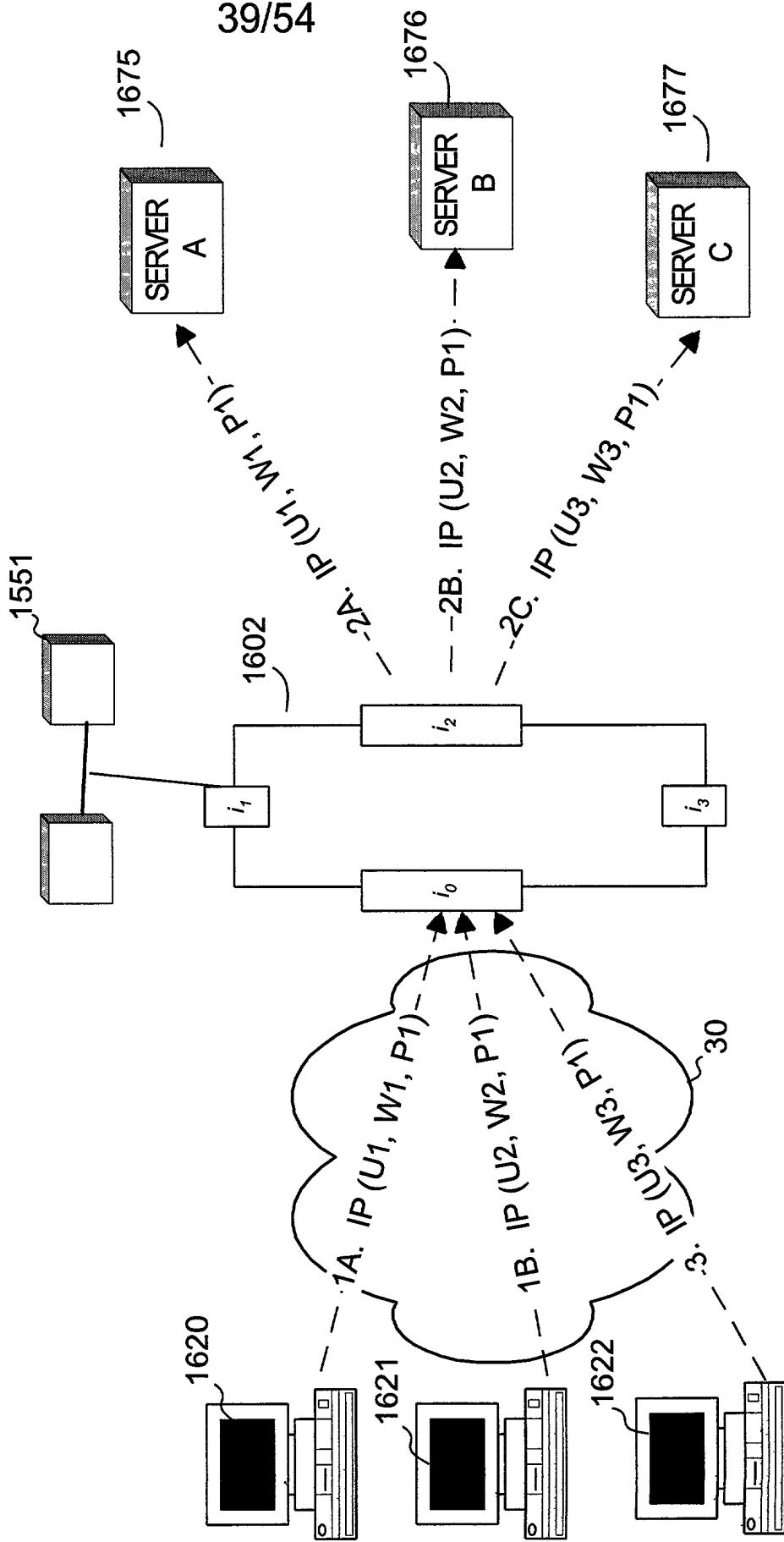


FIG. 16B

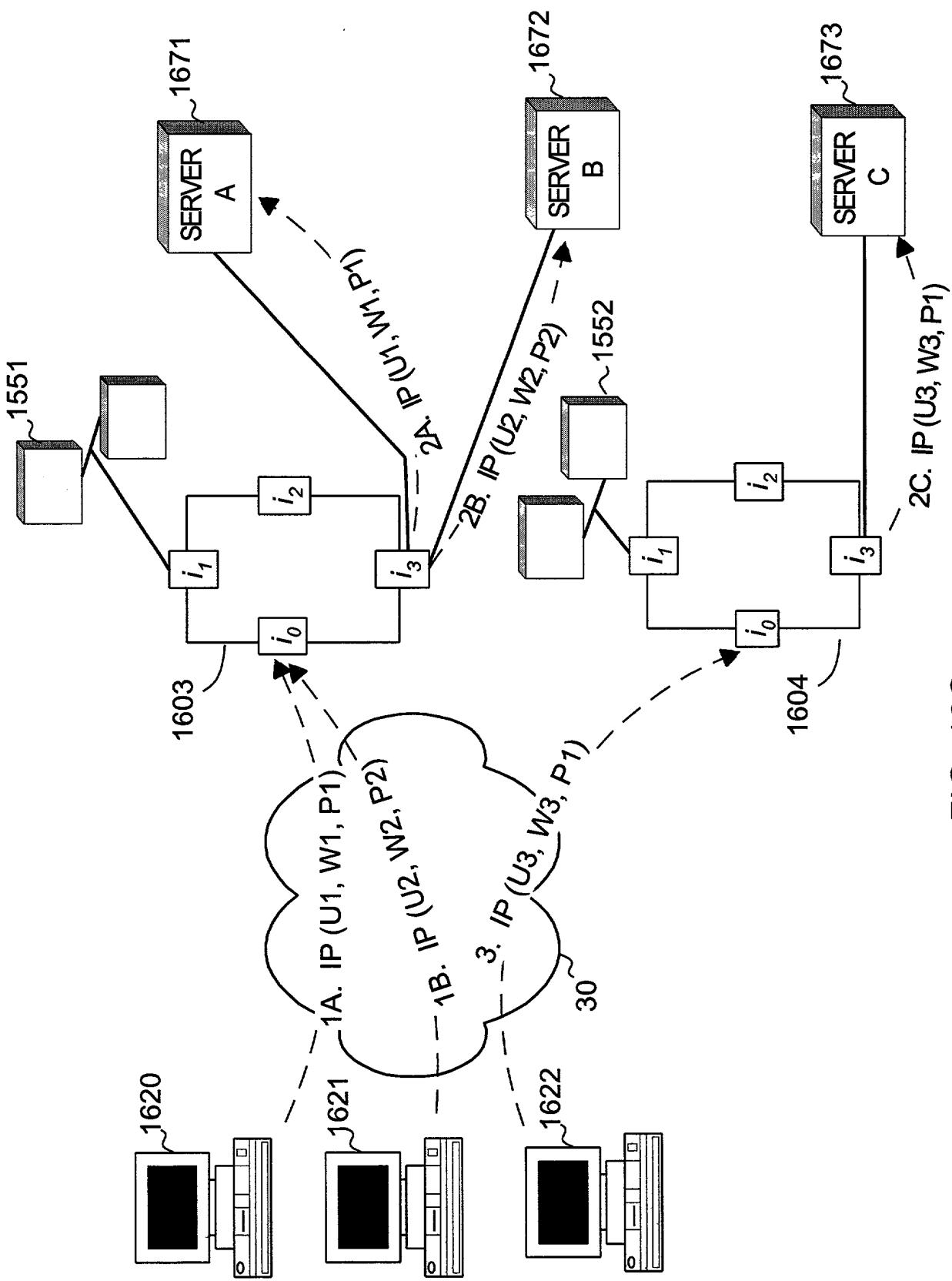
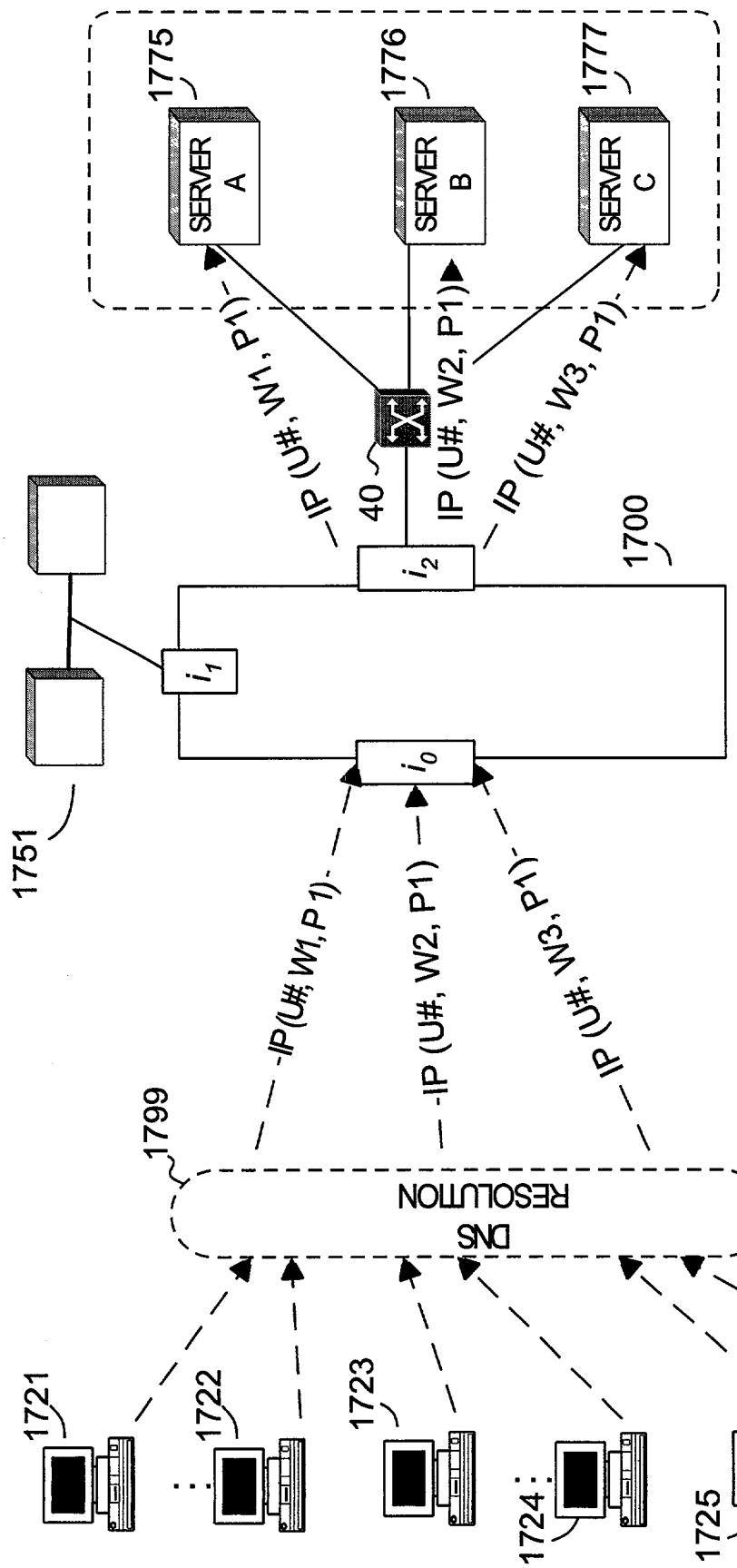


FIG. 16C



DNS ENTRIES

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$"SERVICE\ W1"\Rightarrow SERVICE\ IP\ ADDRESS\ W1$
 $"SERVICE\ W2"\Rightarrow SERVICE\ IP\ ADDRESS\ W2$
 $"SERVICE\ W3"\Rightarrow SERVICE\ IP\ ADDRESS\ W3$

FIG. 17

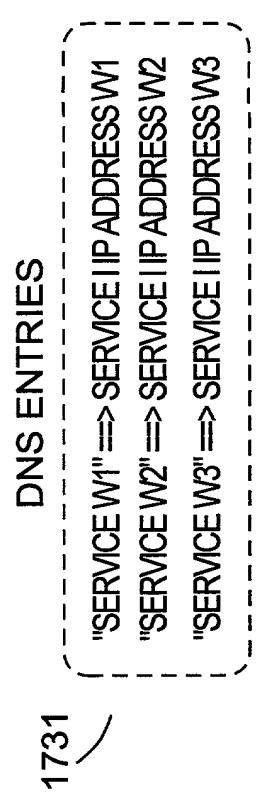


FIG. 17A

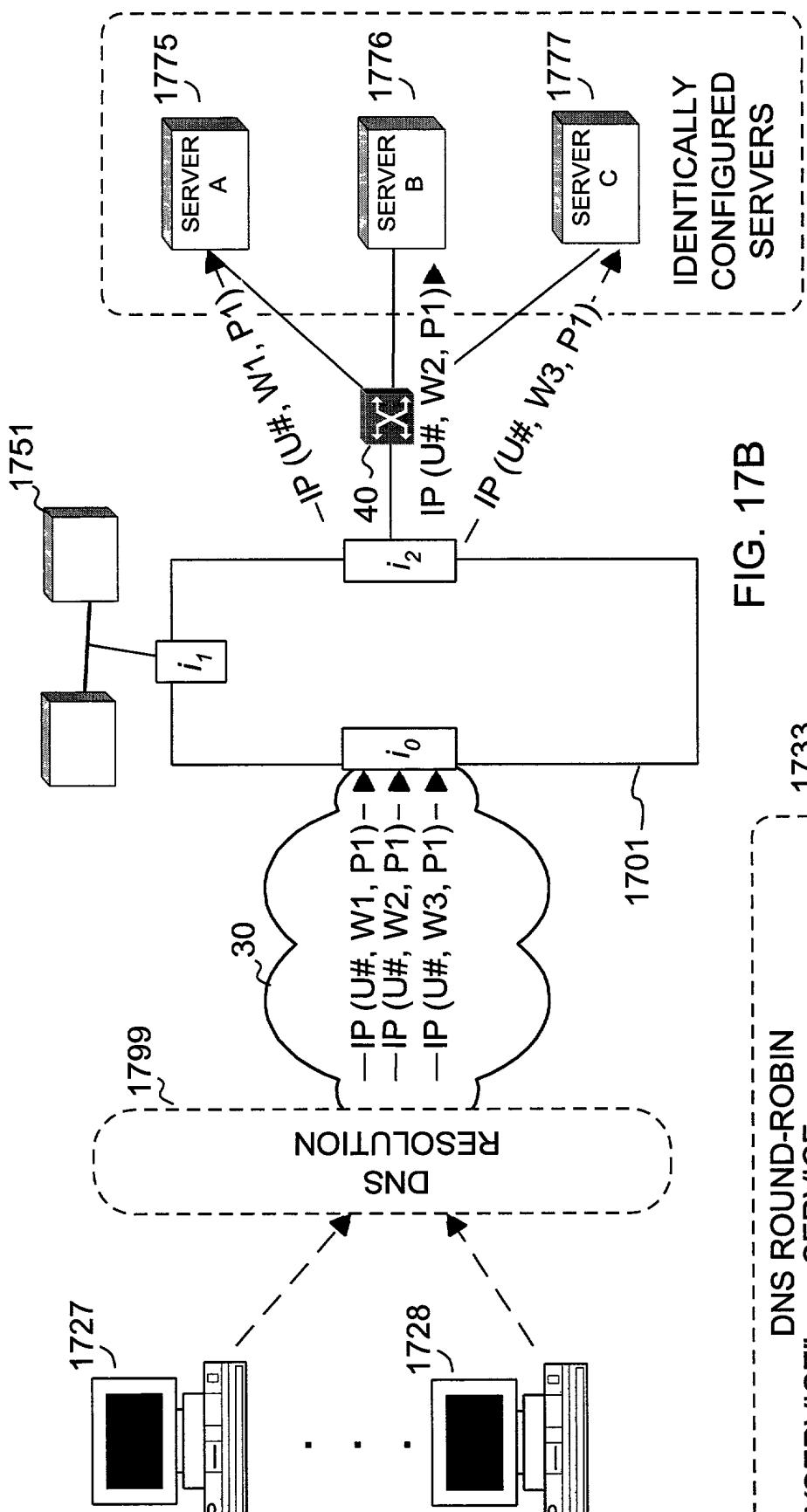


FIG. 17B

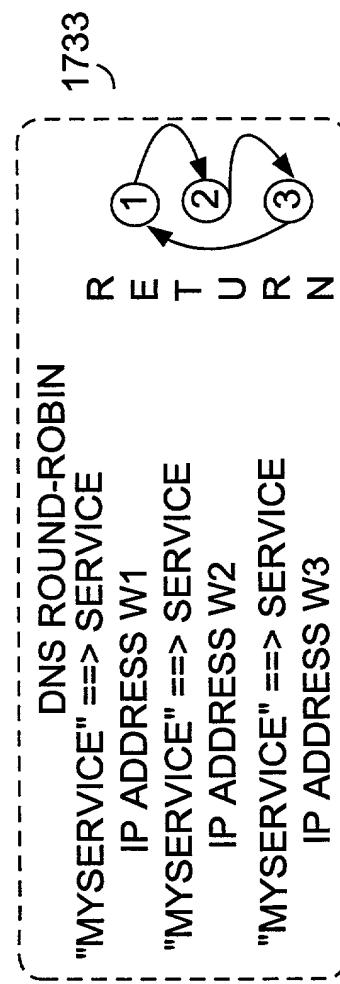


FIG. 17C

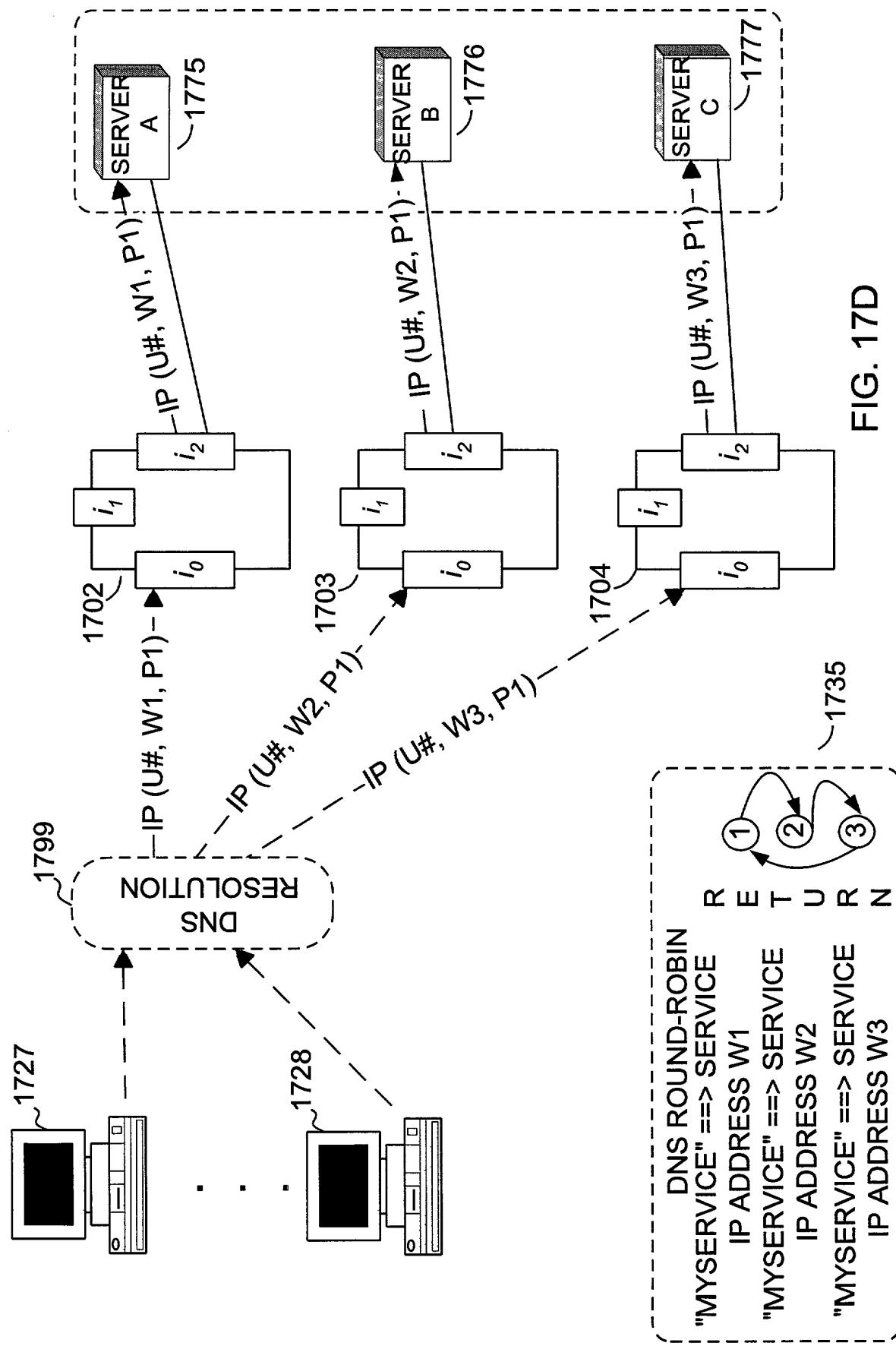


FIG. 17D

FIG. 17E

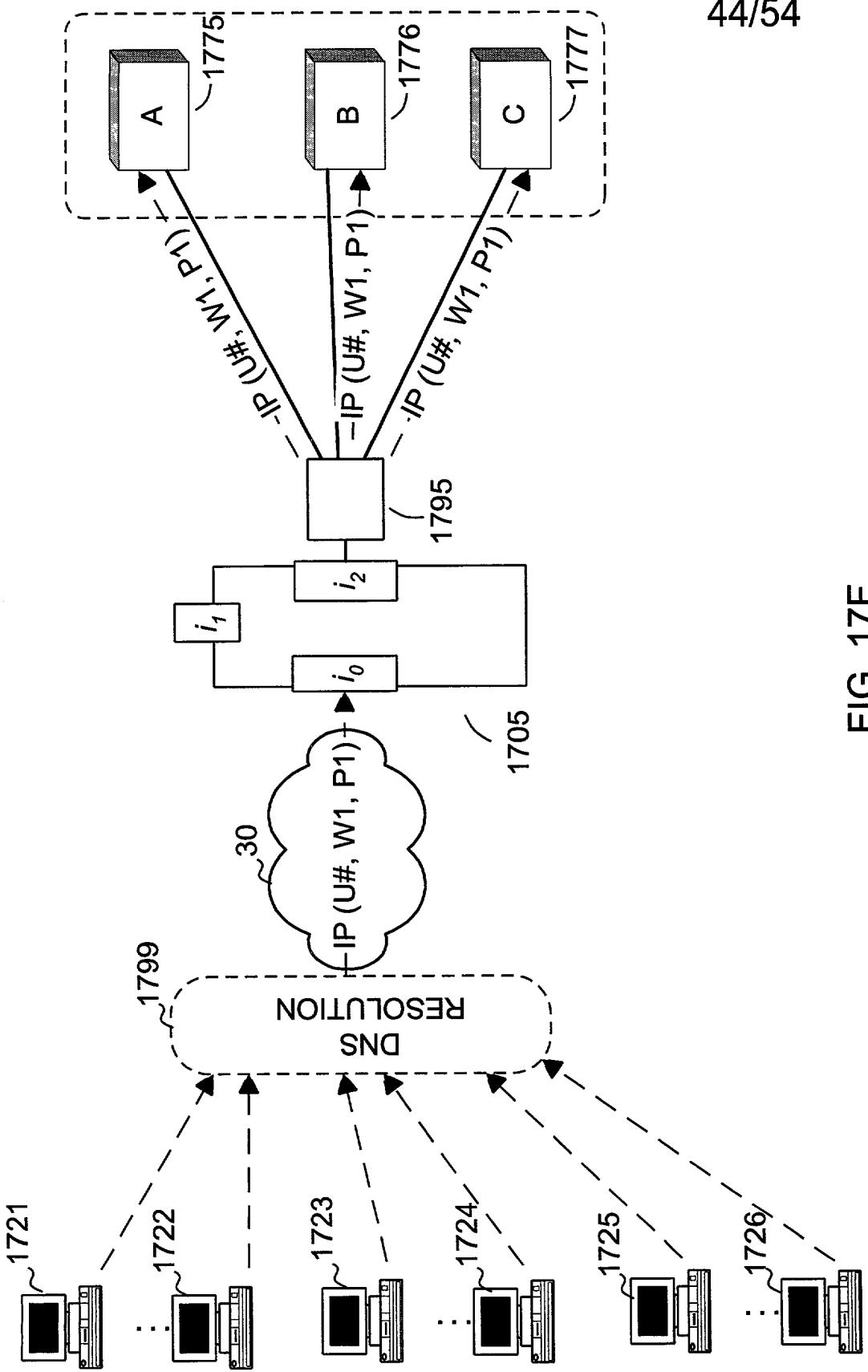


FIG. 17F

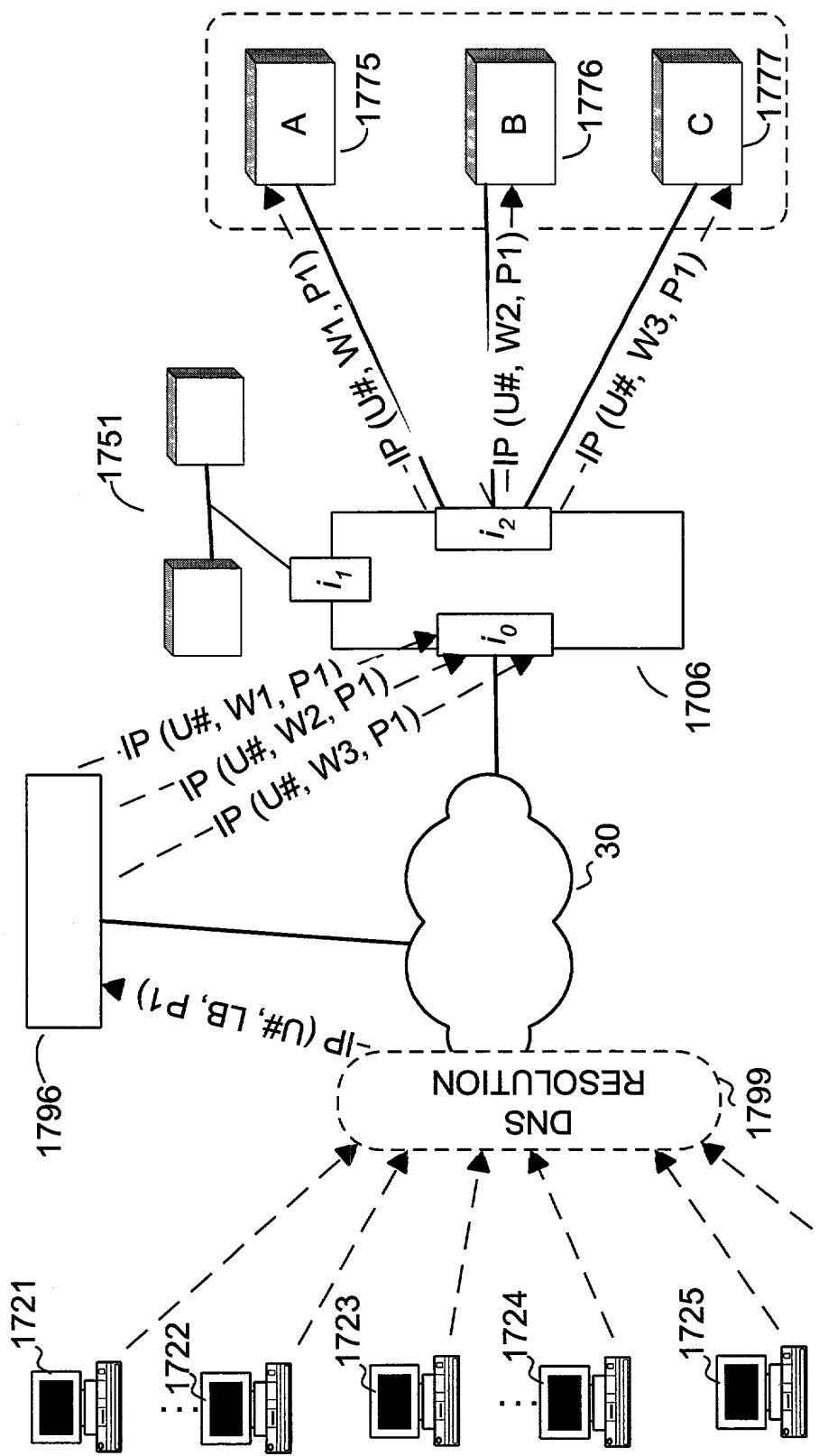
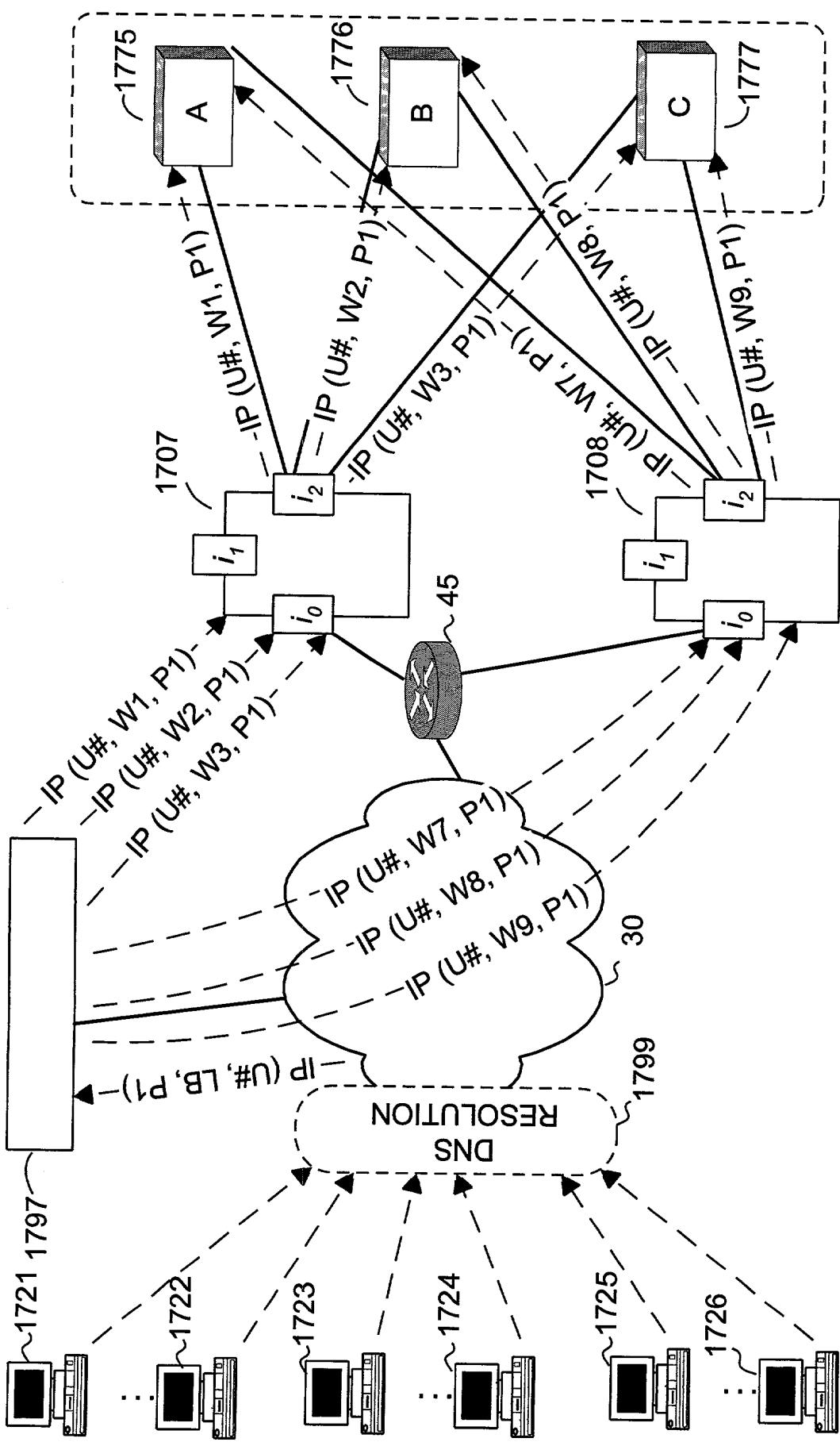


FIG. 17G



FIG. 17H



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FIG. 171

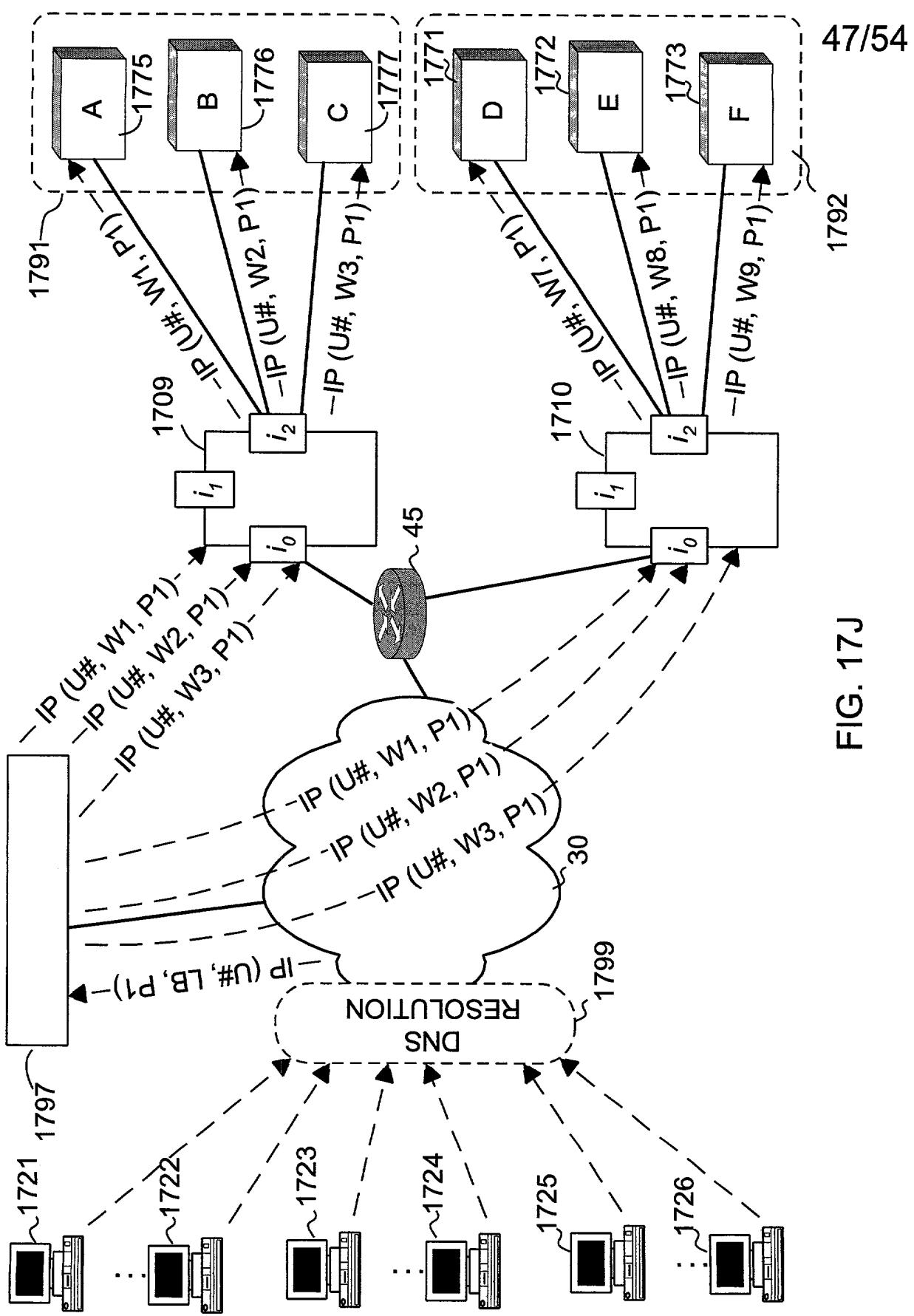


FIG. 17J

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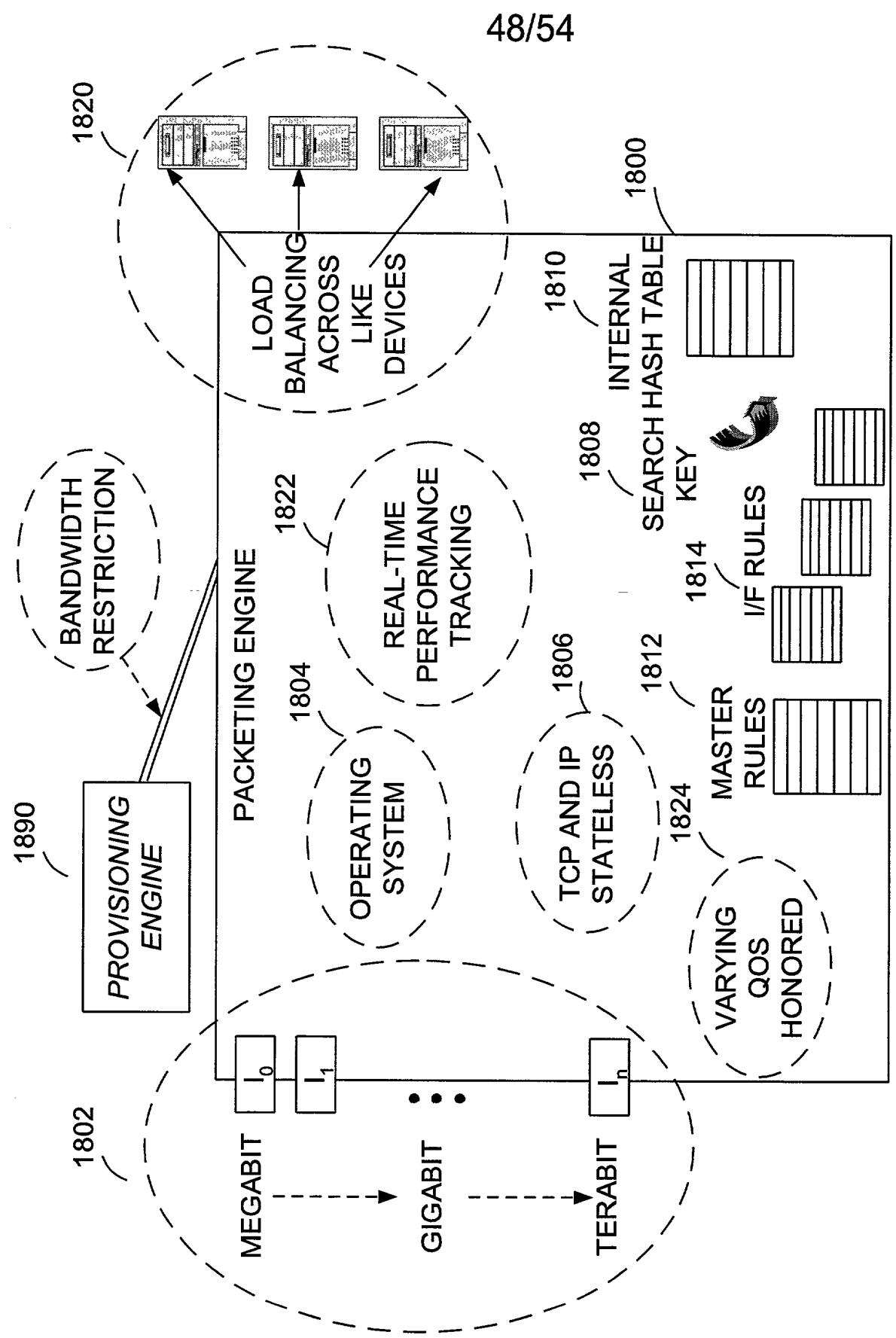


FIG. 18

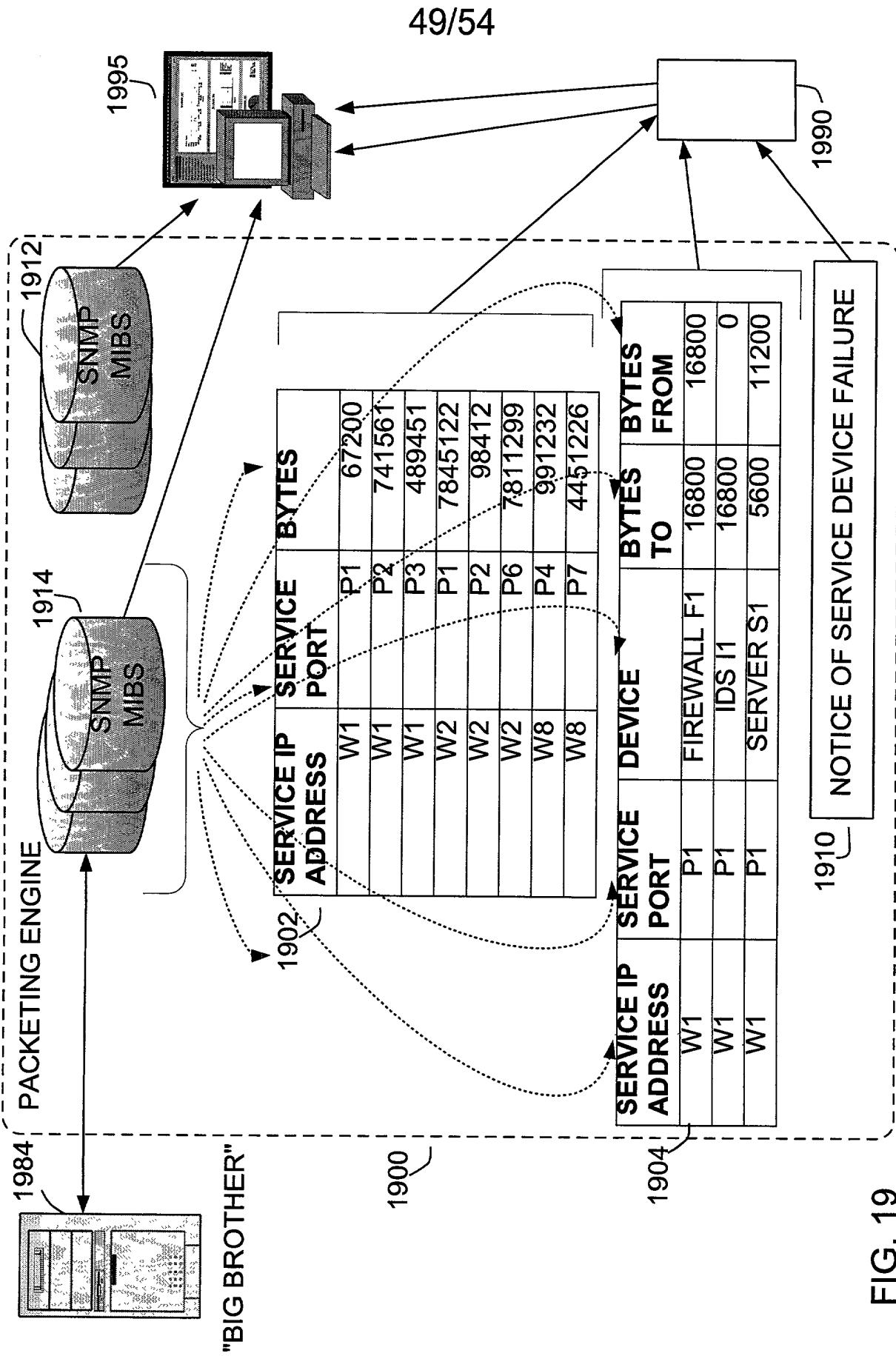


FIG. 19

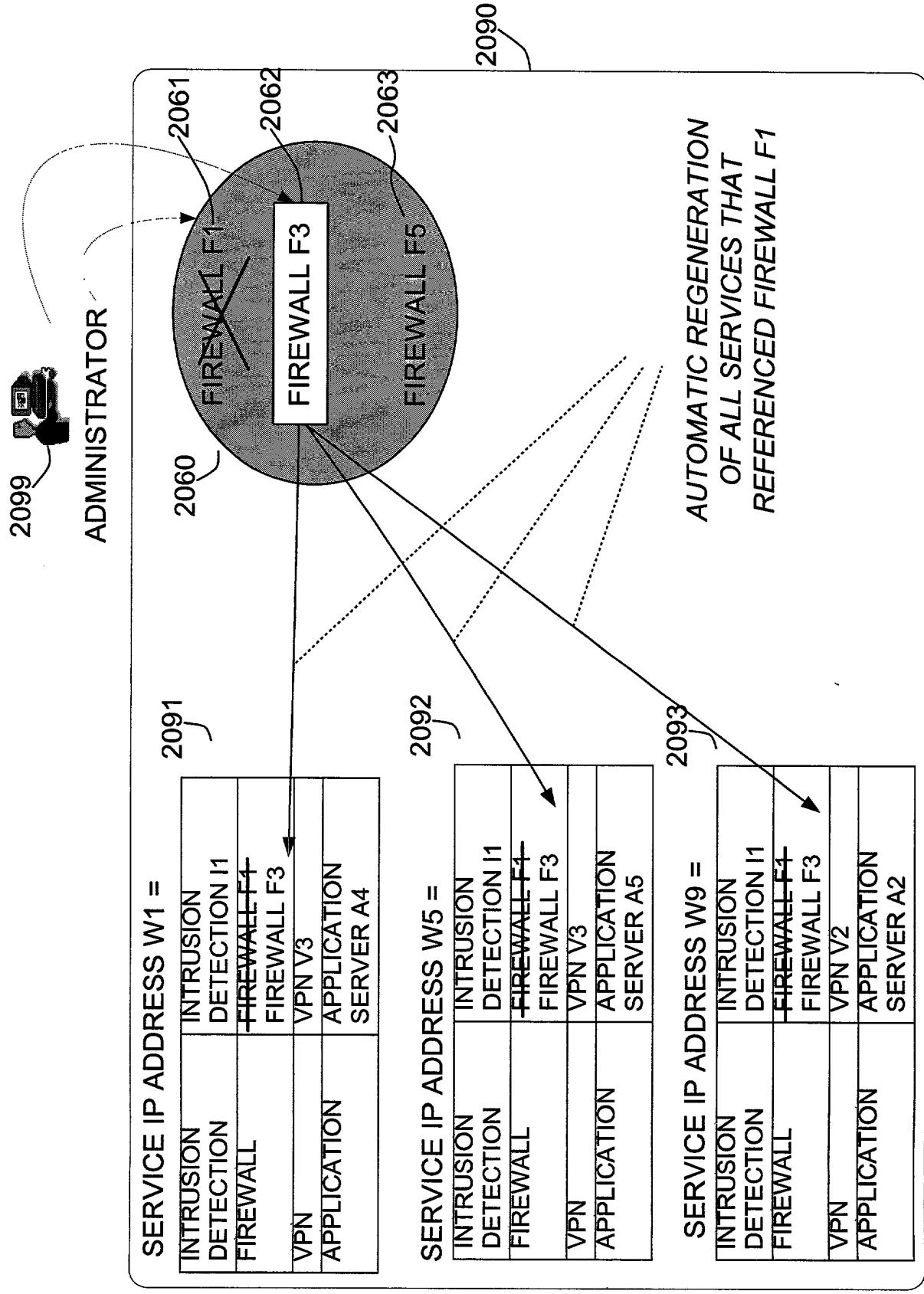


FIG. 20

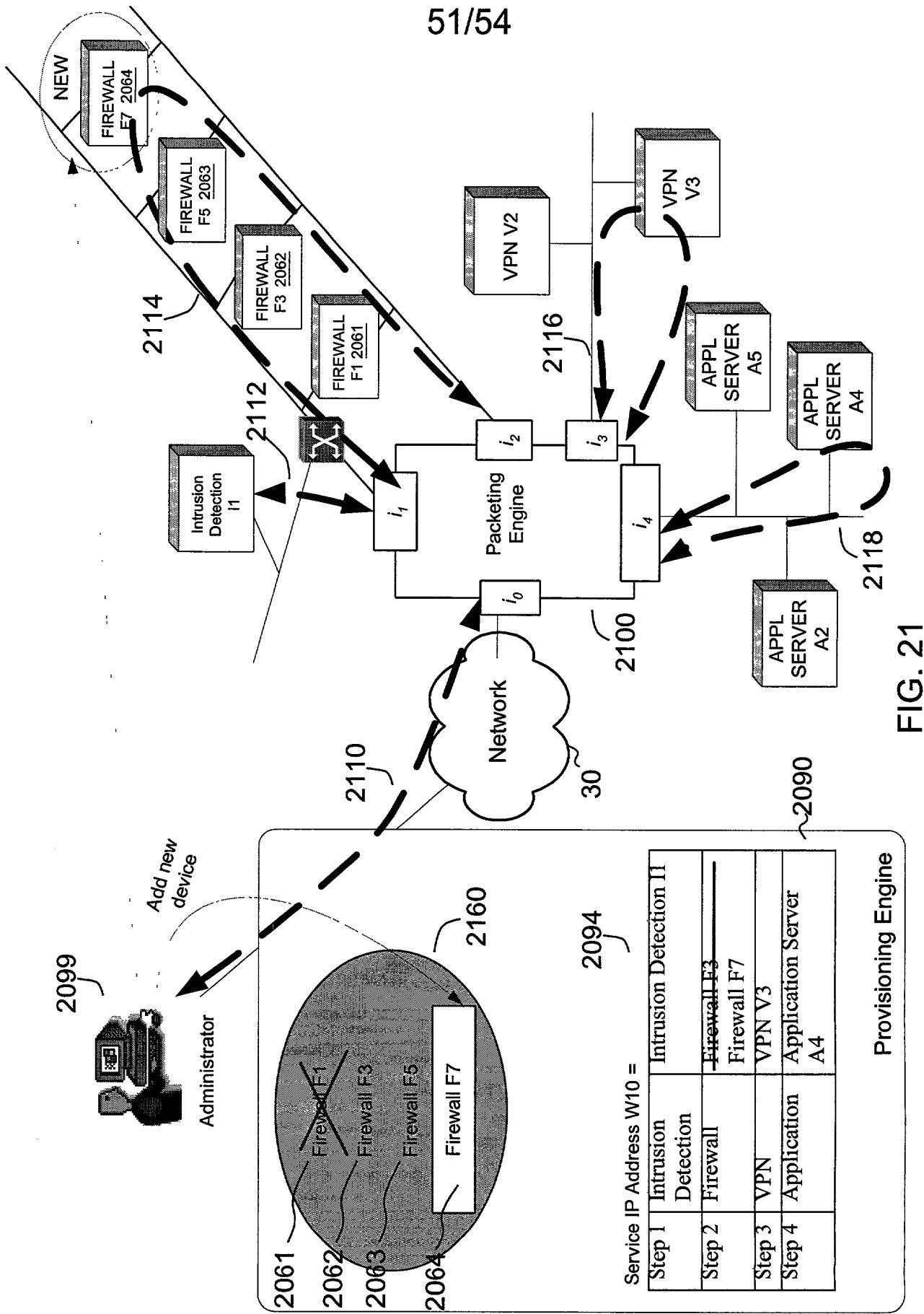


FIG. 21

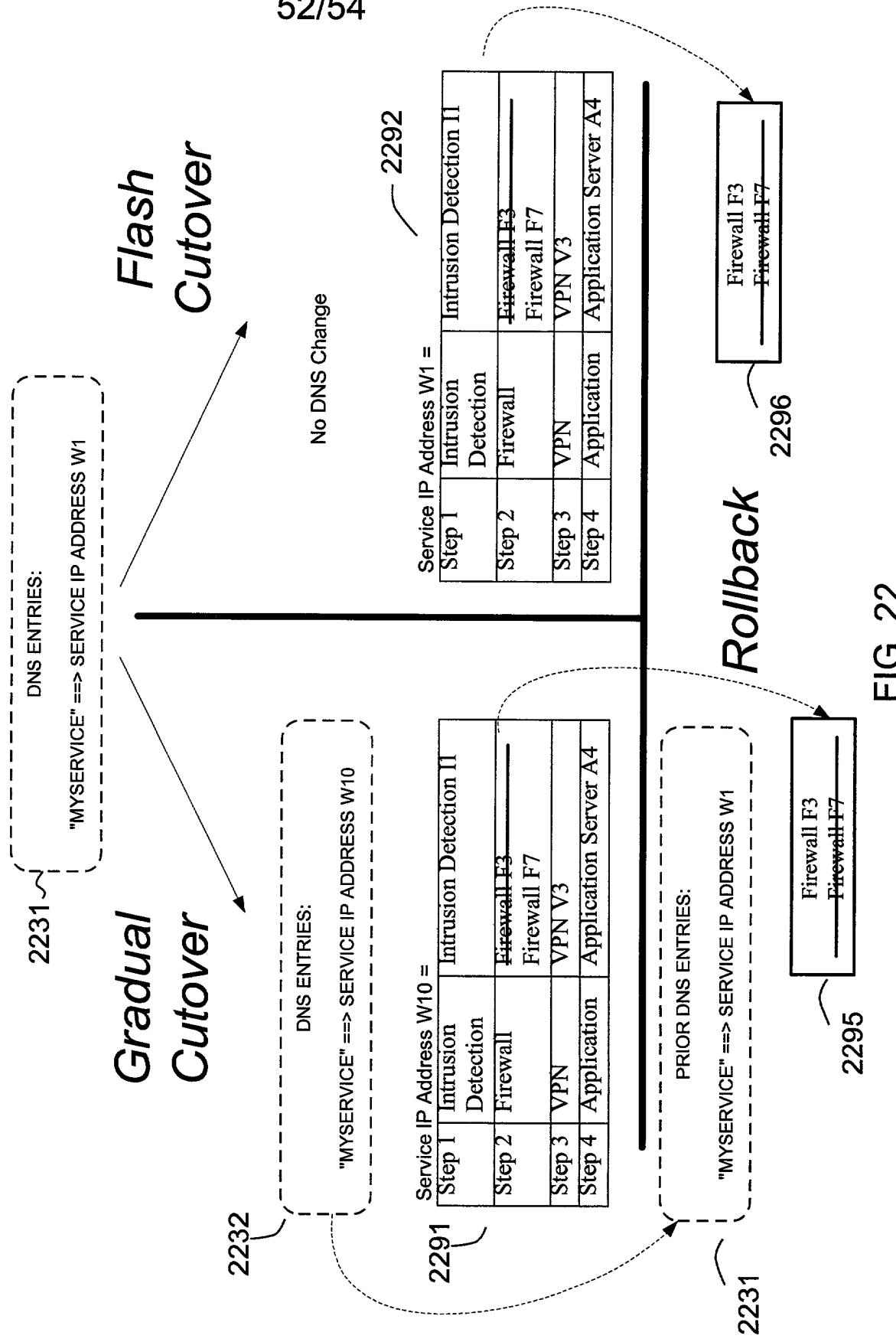


FIG. 22

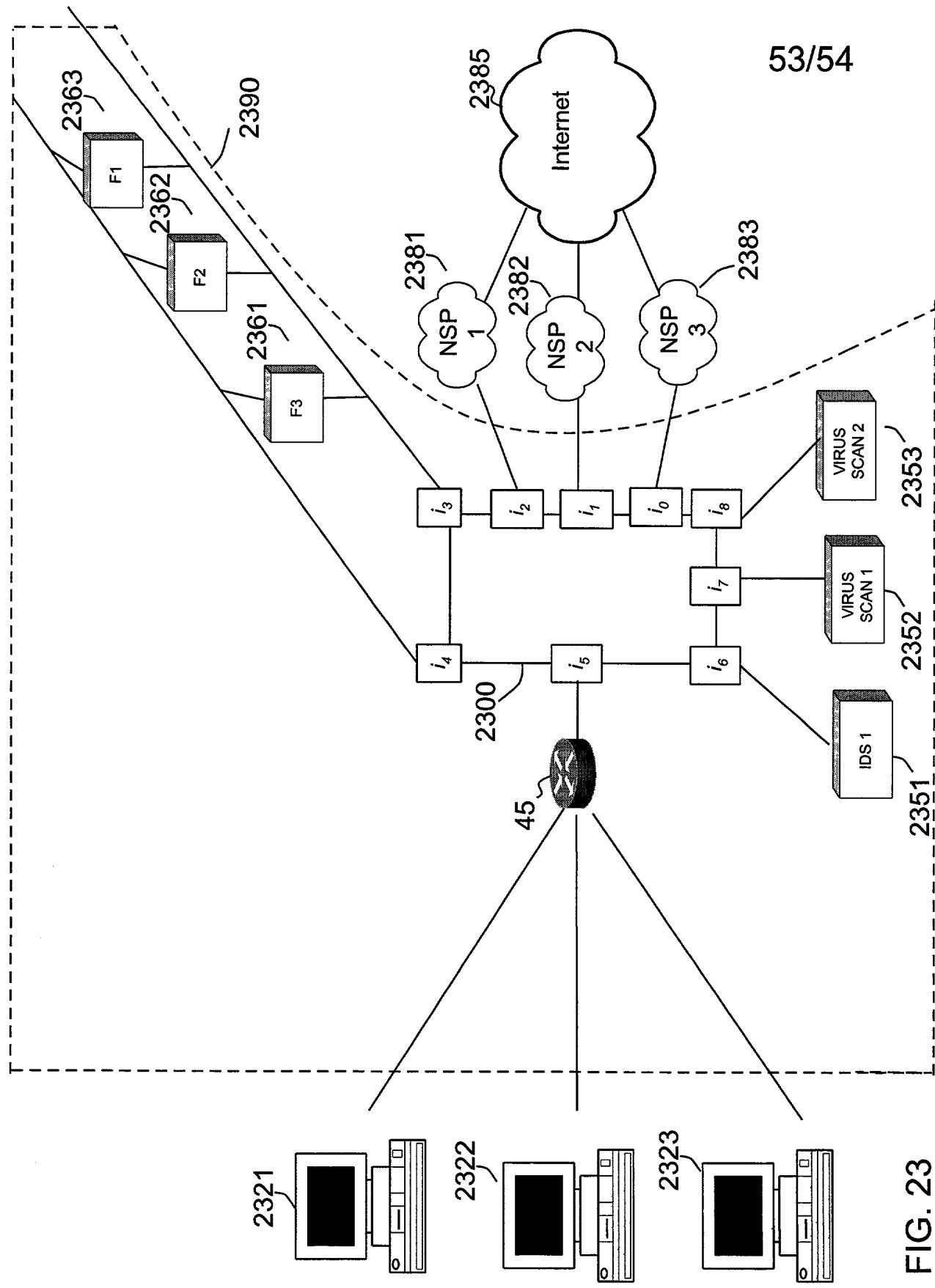


FIG. 23

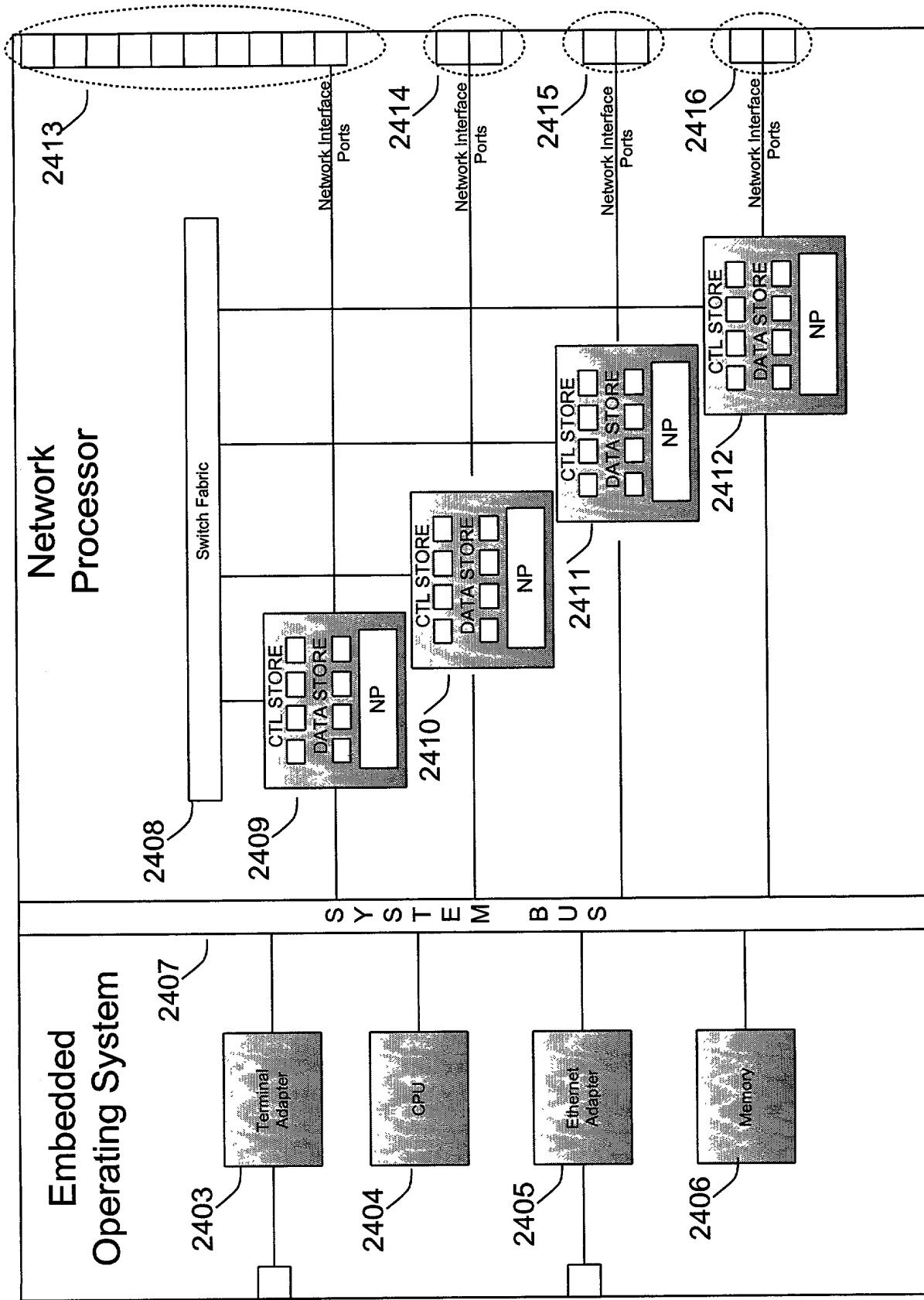


FIG. 24